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PRICE 40 CENTS.

HANDY NOTES & QUERIES.

A MANUAL OF USEFUL INFORMATION

COMPILED BY

Lucy Lobdell

FOR USE OF DEALERS IN

HARDWARE TINWARE METALS

CONNELLY-CO. N.Y.

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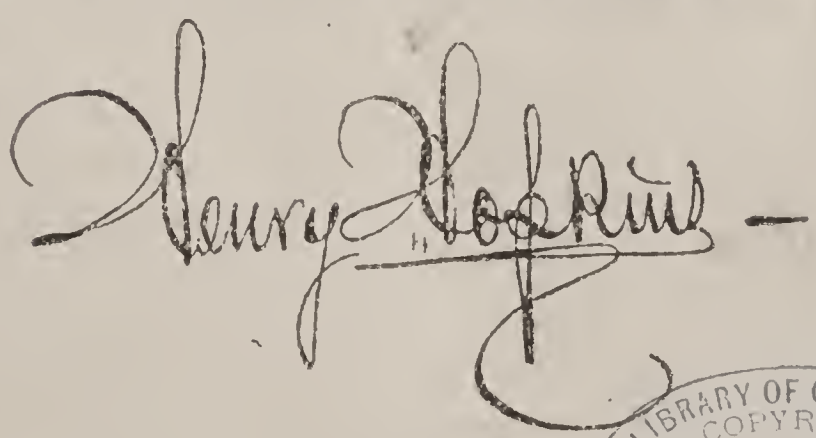
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As well as the various Workers in the Useful Metals,

INCLUDING

A NUMBER OF ADDITIONAL PAGES, GIVING INFORMATION OF A MORE GENERAL CHARACTER.

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16-1912

W. 8 June 14 '15.

PREFACE.

The necessity for a Handy Book of Reference similar to this has been manifest for a great many years; and the knowledge that such a compilation would prove of undoubted utility, has been experienced by every dealer in the articles to which this work refers.

It is no doubt true that many books have been already published which singly or collectively contain nearly all the items of information carefully embodied in this; but most of them are works of limited circulation, not readily obtained, and frequently costing a price that places them beyond the reach of the smaller dealer who is most apt to need the information.

This work has been compiled from a multitude of sources with a great degree of care; many months having been passed in the congenial employment; and the information herein contained will be found reliable, and from the scarcity of similar publications will, we hope naturally recommend its careful preservation.

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BUSINESS LAW IN DAILY USE.

The following compilation of business law contains the essence of a large amount of legal verbage:

If a note is lost or stolen, it does not release the maker; he must pay it, if the consideration for which it was given and the amount can be proven.

Notes bear interest only when so stated.

Principals are responsible for the acts of their agents.

Each individual in a partnership is responsible for the whole amount of the debts of the firm, except in cases of special partnership.

Ignorance of the law excuses no one.

The law compels no one to do impossibilities.

An agreement without consideration is void.

A note made on Sunday is void.

Contracts made on Sunday cannot be enforced.

A note by a minor is void.

A contract made with a minor is void.

A contract made with a lunatic is void.

A note obtained by fraud, or from a person in a state of intoxication, cannot be collected.

It is a fraud to conceal a fraud.

Signatures made with a lead pencil are good in law.

A receipt for money is not always conclusive.

The acts of one partner bind all the rest.

"Value received" is usually written in a note, and should be, but is not necessary. If not written it is presumed by the law, or may be supplied by proof.

The maker of an "accommodation" bill or note (one for which he has received no consideration, having lent his name or credit for the accommodation of the holder) is not bound to the person accommodated, but is bound to all other parties, precisely as if there was a good consideration.

No consideration is sufficient in law if it be illegal in its nature.

Checks or drafts must be presented for payment without unreasonable delay.

Checks or drafts should be presented during business hours, but in this country, except in the case of banks, the time extends through the day and evening.

If the drawee of a check or draft has changed his residence, the holder must use due or reasonable diligence to find him.

If one who holds a check as payee or otherwise, transfers it to another, he has a right to insist that the check be presented that day, or, at farthest, on the following day.

A note indorsed in blank (the name of the indorser only written) is transferable by delivery, the same as if made payable to bearer.

If the time of payment of a note is not inserted, it is held payable on demand.

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NEW YORK.

BUSINESS LAW IN DAILY USE.----Continued.

The time of payment of a note must not depend upon a contingency. The promise must be absolute.

A bill may be written upon any paper, or substitute for it, either with ink or pencil.

The payee should be distinctly named in the note, unless it is payable to bearer.

An indorsee has a right of action against all whose names were on the bill when he received it.

If the letter containing a protest of non-payment be put into the post office, any miscarriage does not affect the party giving notice.

Notice of protest may be sent either to the place of business or of residence of the party notified.

The holder of a note may give notice of protest either to all the previous indorsers or only to one of them; in case of the latter he must select the last indorser, and the last must give notice to the last before him, and so on. Each indorser must send notice the same day or the day following. Neither Sunday or legal holiday is to be counted in reckoning the time in which notice is to be given.

The loss of a bill or note is not sufficient excuse for not giving notice of protest.

If two or more persons as partners are jointly liable on a note or bill, due notice to one of them is sufficient.

If a note or bill is transferred as security, or even as payment of a pre-existing debt, the debt revives if the bill or note be dishonored.

An indorsement may be written on the face or back.

An indorser may prevent his own liability to be sued by writing "without recourse," or similar words.

All claims which do not rest upon a seal or judgment must be sued within six years from the time when they arise.

Part payment of a debt which has passed the time of statutory limitation revives the whole debt, and the claim holds good for another period of six years from the date of such partial payment.

A verbal promise to pay, made without condition, is generally held as sufficient to revive a claim otherwise shut out by the law of limitation.

If, when a debt is due, the debtor is out of the State, the "six years" do not begin to run until he returns. If he afterward leave the State, the time forward counts the same as if he remained in the State.

An oral agreement must be proved by evidence. A written agreement proves itself. The law prefers written to oral evidence because of its precision.

No evidence may be introduced to contradict or vary a written contract; but it may be received in order to explain it, when such contract is in need of explanation.

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Bills of Exchange, Drafts, Acceptances.

A Bill of Exchange or Draft is an order drawn by one person or firm upon another, payable either at sight or at a stated future time.

It becomes an "Acceptance" when the party upon whom it is drawn writes across the face "Accepted," and signs his name thereto, and is negotiable and bankable the same as a note, and subject to the same laws.

In many States both Sight and Time drafts are entitled to three days grace, the same as notes; but if made in form of a bank check, "pay to," without the words "at sight" it is payable on presentation without grace.

Demand Notes are payable on presentation without grace, and bear legal interest, after a demand has been made, if not so written. An endorser on a demand note is holden only for a limited time, variable in different States.

A Negotiable Note must be made payable either to bearer, or be properly endorsed by the person to whose order it is made. If the endorser wishes to avoid responsibility, he can endorse "without recourse."

A Joint Note is one signed by two or more persons, who each become liable for the whole amount.

Three Days' Grace are allowed on all time notes, after the time for payment expires; if not then paid, the endorser, if any, should be legally notified, to be holden.

Foreign Exchange, Value of U. S. Coins, etc.

The value of One Pound Sterling or an English Sovereign, compared with old U. S. coins is $4.444, but Congress has, from time to time, reduced the weight and purity of U. S. coins, making their value as metals less than their value as coins, and has established the present legal value of a Pound Sterling at $4.84. Exchange is based on the older nominal value of a Pound, so that when exchange is said to be at 9 per cent. premium, it is then at par value; when below 9 per cent., it is below par; and when above 9 per cent., above par, etc.

Copartnerships.

Partnerships may be either general or special. In general partnerships, money invested ceases to be individual property. Each member is made personally liable for the whole amount of debts incurred by the company. The company is liable for all contracts or obligations made by individual members.

Special Partners are not liable beyond the amount contributed.

A person may become a partner by allowing people generally to presume that he is one, as, by having his name on the sign, or parcels, or in the bills used in the business.

A share or specific interest in the profits or loss of a business, as remuneration for labor, may involve one in the liability of a partner.

In case of Bankruptcy, the joint estate is first applied to the payment of partnership debts, the surplus only going to the creditors of the individual estate.

A Dissolution of partnership may take place under express stipulations in the articles of agreement, by mutual consent, by the death or insanity of one of the firm, by award of arbitrators, or by court of equity in cases of misconduct of some member of the firm.

A partner signing his individual name to negotiable paper, which is for the use of the partnership firm, binds all the partners thereby. Negotiable paper of the firm, even though given on private account by one of the partners, will hold all the partners of the firm when it passes into the hands of holders who are ignorant of the fact attending its creation.

Partnership effects may be bought and sold by a partner; he may make contracts; may receive money; endorse, draw, and accept bills and notes; and while this may be for his own private account, if it apparently be for the use of the firm, his partners will be bound by his action, provided the parties dealing with him were ignorant of the transaction being on his private account; and thus a presentation or misrepresentation of a partner, having relation to business of the firm, will bind the members in the partnership.

In case of Death, the surviving partners must account to the representatives of the deceased.

THE NORWICH



Lock Manufacturing Co.,

NORWICH, Conn., U. S. A.,

MANUFACTURERS OF

DOOR LOCKS and KNOBS

Of every description.

BRONZE HARDWARE,

A full and extensive line in all the popular styles of elaborate design and perfect finish.

BRASS AND BRONZED PADLOCKS,

In new and saleable patterns.

CAST AND WROUGHT IRON PADLOCKS,

With Malleable or Flat Steel Keys.

CAST STEEL WARRANTED SHEARS,

Of unsurpassed quality.

And a large and constantly increasing line of

BUILDERS' HARDWARE.

Including all the latest styles, and consisting of

Bronzed and Solid Bronze Door Butts and Handles, Sash Butts, Shutter Bars, Sash Lifts, Drawer Pulls, Door Bolts, Cupboard Turns, and Screen Door Catches.

For any or all of which orders are respectfully solicited.

INTEREST TABLE.

Six Per Cent.

Time.	$1	$2	$3	$4	$5	$6	$7	$8	$9	$10	$100	$1000
1 Day.....	0	0	0	0	0	0	0	0	0	0	2	17
2 "	0	0	0	0	0	0	0	0	0	0	3	33
3 "	0	0	0	0	0	0	0	0	0	1	5	50
4 "	0	0	0	0	0	0	0	1	1	1	7	67
5 "	0	0	0	0	0	1	1	1	1	1	8	83
6 "	0	0	0	0	1	1	1	1	1	1	10	1 00
7 "	0	0	0	0	1	1	1	1	1	1	12	1 17
8 "	0	0	0	1	1	1	1	1	1	1	13	1 33
9 "	0	0	0	1	1	1	1	1	1	2	15	1 50
10 "	0	0	1	1	1	1	1	1	2	2	17	1 67
11 "	0	0	1	1	1	1	1	1	2	2	18	1 83
12 "	0	0	1	1	1	1	1	2	2	2	20	2 00
13 "	0	0	1	1	1	1	2	2	2	2	22	2 17
14 "	0	0	1	1	1	1	2	2	2	2	23	2 33
15 "	0	1	1	1	1	2	2	2	2	3	25	2 50
16 "	0	1	1	1	1	2	2	2	2	3	27	2 67
17 "	0	1	1	1	1	2	2	2	3	3	28	2 83
18 "	0	1	1	1	2	2	2	2	3	3	30	3 00
19 "	0	1	1	1	2	2	2	3	3	3	32	3 17
20 "	0	1	1	1	2	2	2	3	3	3	33	3 33
21 "	0	1	1	1	2	2	2	3	3	4	35	3 50
22 "	0	1	1	1	2	2	3	3	3	4	37	3 67
23 "	0	1	1	2	2	2	3	3	3	4	38	3 83
24 "	0	1	1	2	2	2	3	3	4	4	40	4 00
25 "	0	1	1	2	2	3	3	3	4	4	42	4 17
26 "	0	1	1	2	2	3	3	3	4	4	43	4 33
27 "	0	1	1	2	2	3	3	4	4	5	45	4 50
28 "	0	1	1	2	2	3	3	4	4	5	47	4 67
29 "	0	1	1	2	2	3	3	4	4	5	48	4 83
1 Mon.....	1	1	2	2	3	3	4	4	5	5	50	5 00
2 "	1	2	3	4	5	6	7	8	9	10	1 00	10 00
3 "	2	3	5	6	8	9	11	12	14	15	1 50	15 00
4 "	2	4	6	8	10	12	14	16	18	20	2 00	20 00
5 "	3	5	8	10	13	15	18	20	23	25	2 50	25 00
6 "	3	6	9	12	15	18	21	24	27	30	3 00	30 00
7 "	4	7	11	14	18	21	25	28	32	35	3 50	35 00
8 "	4	8	12	16	20	24	28	32	36	40	4 00	40 00
9 "	5	9	14	18	23	27	32	36	41	45	4 50	45 00
10 "	5	10	15	20	25	30	35	40	45	50	5 00	50 00
11 "	6	11	17	22	28	33	39	44	50	55	5 50	55 00
1 Year.....	6	12	18	24	30	36	42	48	54	60	6 00	60 00

RUSSELL & ERWIN MF'G CO.

43, 45 AND 47 CHAMBERS ST.,

NEW YORK,

NEW BRITAIN, CONN.,

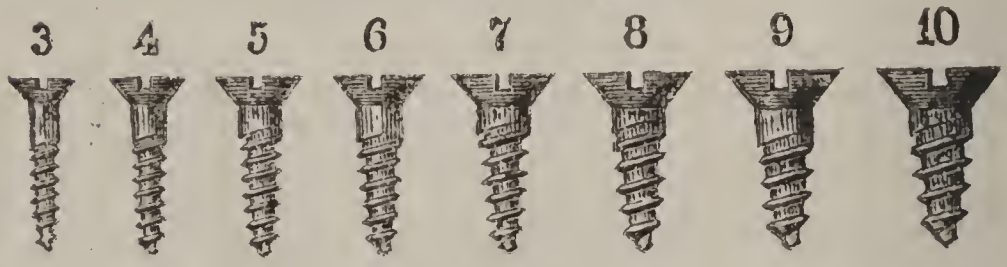
PHILADELPHIA, PA.,

BALTIMORE, MD.,

Manufacturers of

HARDWARE

ONE HALF INCH.



—AND—

IRON AND BRASS WOOD SCREWS,

Machine Screws, Coach Screws,

STOVE BOLTS, TIRE BOLTS,

RIVETS, &c.

Rate of Annual Income of Investments,

PAR VALUE BEING $100, BEARING INTEREST AT

Price paid.	5%	6%	7%	8%	10%
$50	10.00	12.00	14.00	16.00	20.00
55	9.09	10.90	12.72	14.55	18.18
60	8.33	10.00	11.66	13.33	16.66
65	7.69	9.23	10.76	12.30	15.38
70	7.14	8.57	10.00	11.42	14.28
75	6.66	8.00	9.33	10.66	13.35
80	6.25	7 50	8.75	10.00	12.50
82½	6.06	7.27	8.48	9.69	11.12
85	5.88	7.05	8.23	9.41	11.76
87½	5.71	6.85	8.00	9.14	11.42
90	5.55	6.66	7 77	8.88	11.11
92½	5.40	6.48	7.56	8.64	10.80
95	5.26	6.31	7.36	8.42	10 52
96	5.20	6.25	7.29	8.33	10.41
97	5.15	6.18	7.21	8.24	10.30
97½	5.12	6.15	7.17	8.20	10.25
98	5.10	6.12	7.14	8.16	10.20
99	5.05	6.06	7.07	8.08	10.10
100	5.00	6.00	7.00	8.00	10.00
101	4.95	5.94	6.93	7.92	9.90
102	4.90	5.88	6 86	7.84	9.80
103	4.85	5.82	6.79	7.76	9.70
104	4.80	5.76	6.73	7.69	9.61
105	4.76	5.71	6.66	7.61	9.52
110	4.54	5.45	6.36	7.27	9.09
115	4.34	5.21	6.08	6.95	8.69
120	4.16	5.00	5.83	6.66	8.33
125	4.00	4.80	5.60	6.40	8.00
130	3.84	4.61	5.38	6.15	7.69
135	3.70	4.44	5.18	5 92	7.40
140	3.57	4.28	5.00	5.71	7.14
145	3.44	4.13	4.82	5.51	6.89
150	3.33	4.00	4.66	5.33	6.66

Interest Rules.

FOUR PER CENT.—Multiply the principal by the number of days to run; separate the right hand figure from product, and divide by 9.

FIVE PER CENT.—Multiply by number of days, and divide by 72.

SIX PER CENT.—Multiply by number of days; separate right hand figure, and divide by 6.

SEVEN AND THREE-TENTHS PER CENT.—Multiply by number of days, and double the amount so obtained. On $100 the interest is just two cents per day.

EIGHT PER CENT.—Multiply by number of days, and divide by 45.

NINE PER CENT.—Multiply by number of days; separate right hand figure, and divide by 4.

TEN PER CENT.—Multiply by number of days, and divide by 36.

TWELVE PER CENT.—Multiply by number of days; separate right hand figure, and divide by 3.

The SARGENT SPRAGUE CAN OPENER



It is the best.

FOR OPENING TIN PACKAGES OF FISH, OYSTERS, FRUIT, & VEGETABLES.

It is unequaled.

IT SHEARS CLEAN, EASILY OPERATED
LEAVING NO RAGGED EDGES.
ALWAYS IN ORDER.

SARGENT & CO. | SOLE PROPRIETORS AND MANUFACTURERS, 37 CHAMBERS ST. NEW YORK, NEW HAVEN CONN.

THE SARGENT-SPRAGUE CAN OPENER!

Is unequalled for opening Tin Cans of **ANY SHAPE OR SIZE.** The **DOUBLE FOOT** gives it a bearing on both sides of the Knife, thus bringing the cutting edge in position to make a CLEAN SHEAR CUT, without leaving the tin torn or ragged; the double bearing also prevents an unequal strain upon the rivet, and insures durability with RAPID and SATISFACTORY work. Well made. Requires no adjusting. Always ready for use.

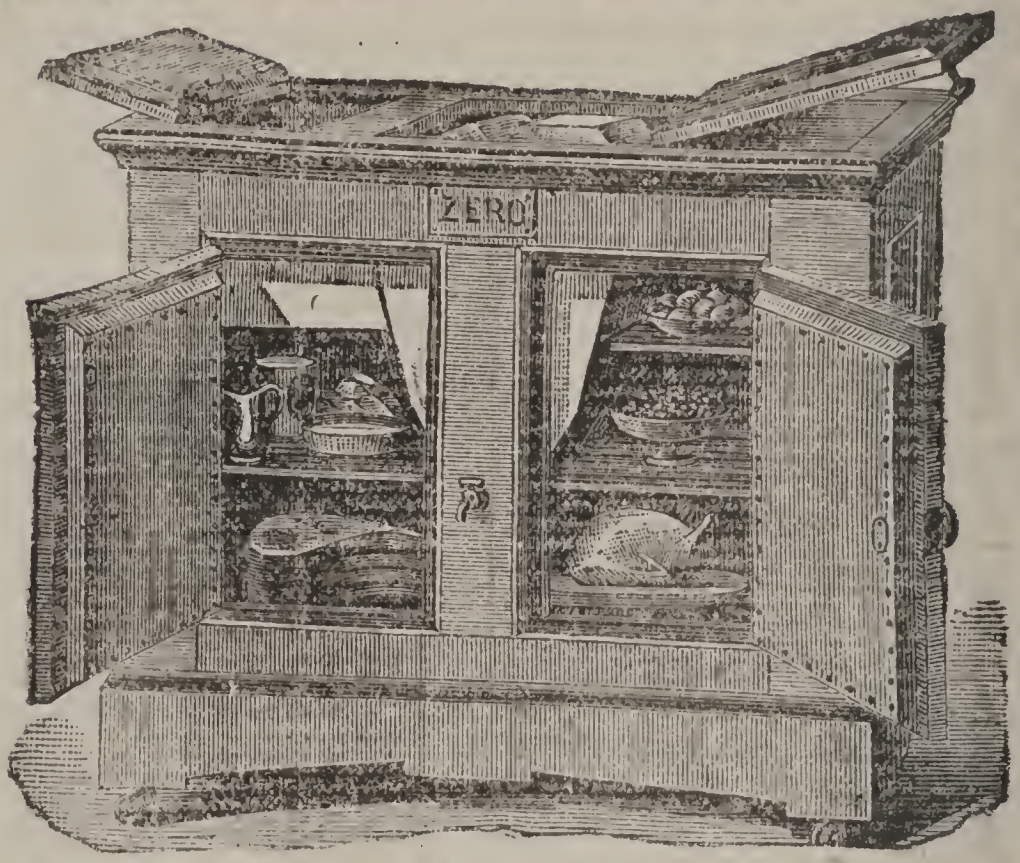
IT IS THE BEST AND MOST POPULAR.

Total Value of Articles by the Piece, Reckoned from 1 to 1 Dozen.

1.....	8 1/3	10 5/12	12 1/2	14 7/12	16 2/3	18 3/4	20 5/6	22 11/12	25	29 1/6	31 1/4	33 1/3	35 5/12	37 1/2	39 7/12	41 2/3	43 3/4	45 5/6	47 11/12	50
2.....	17	21	25	29	33	38	42	46	50	58	63	67	71	75	79	83	88	92	96	1.00
3.....	25	31	38	44	50	56	63	69	75	88	94	1.00	1.06	1.13	1.19	1.25	1.31	1.38	1.44	1.50
4.....	33	42	50	56	67	75	83	92	1.00	1.17	1.25	1.33	1.42	1.50	1 58	1.67	1.75	1.83	1.92	2.00
5.....	42	52	63	73	83	94	1.04	1.15	1.25	1.46	1.56	1.67	1.77	1.88	1.98	2.08	2.19	2.29	2.40	2.50
6.....	50	63	75	88	1.00	1.13	1.25	1.38	1.50	1.75	1.88	2.00	2.13	2.25	2.34	2.50	2.63	2.75	2.87	3.00
7.....	58	73	88	1.02	1.17	1.31	1.46	1.60	1.75	2.04	2.19	2.33	2.48	2.63	2.77	2.92	3.06	3.21	3.35	3.50
8.....	67	83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.33	2.50	2.67	2.83	3.00	3.17	3.33	3.50	3.67	3.83	4.00
9.....	75	94	1.13	1.29	1.50	1.69	1.88	2.06	2.25	2.63	2.81	3.00	3.19	3.38	3.56	3.75	3.94	4.13	4 31	4.50
10.....	83	1.04	1.25	1.46	1.67	1.88	2.08	2.29	2.50	2.92	3.13	3.33	3.54	3.75	3.96	4 17	4.38	4.58	4.79	5.00
11.....	92	1.15	1.38	1.60	1.83	2.06	2.29	2.52	2.75	3.21	3.44	3.67	3.89	4.13	4.23	4.58	4.81	5.04	5.27	5.50
12.....	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00

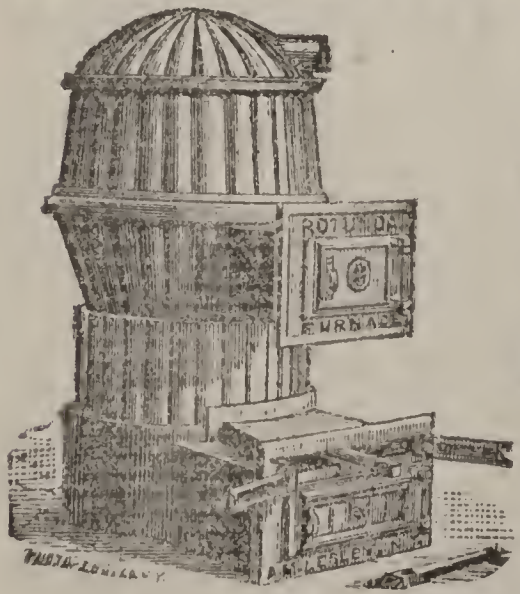
1.....	52 1/2	54 1/6	56 1/4	58 1/3	60 5/12	62 1/2	64 7/12	66 2/3	68 3/4	70 5/6	72 11/12	75	77 1/12	79 1/6	81 1/4	83 1/3	87 1/2	91 2/3	95 5/6	1.00
2.....	1.04	1.08	1.13	1.17	1.21	1.25	1.29	1.33	1.38	1.42	1.46	1.50	1.54	1.58	1.63	1.67	1.75	1.83	1.92	2.00
3.....	1.56	1.63	1.69	1.75	1.81	1.88	1.94	2.00	2.06	2.13	2.19	2.25	2.31	2.38	2.44	2.50	2.63	2 75	2.88	3.00
4.....	2.08	2.17	2.25	2.33	2.42	2.50	2.58	2.67	2.75	2.83	2 92	3.00	3.08	3.17	3.25	3.33	3.50	3.67	3.83	4.00
5.....	2.60	2.71	2.8[illegible]	2.92	3.02	3.13	3.23	3.33	3.44	3.54	3.65	3.75	3.85	3.96	4.06	4.17	4.38	4.58	4.79	5.00
6.....	3.13	3.25	3.38	3.50	3.63	3.75	3.88	4.00	4.13	4.25	4.38	4.50	4.63	4.75	4.88	5.00	5.25	5.50	5.75	6.00
7.....	3.65	3.79	3.94	4.08	4.23	4 38	4.52	4.67	4.81	4.96	5.10	5.25	5.40	5.54	5.69	5.83	6.13	6.42	6 71	7.00
8.....	4.17	4.33	4.50	4.67	4 93	5.00	5.17	5.33	5.50	5.67	5.83	6.00	6.15	6.33	6.50	6.67	7.00	7.33	7.66	8.00
9.....	4.69	4.88	5.06	5.25	5.44	5.63	5.81	6.00	6.19	6.38	6.56	6.75	6.94	7.13	7.31	7.50	7.88	8.25	8.62	9.00
10.....	5.21	5.42	5.63	5.83	6.04	6.25	6.46	6.67	6.88	7.08	7.29	7.50	7.71	7.92	8.13	8.33	8.75	9.17	9.58	10.00
11.....	5.73	5 96	6.19	6.42	6.65	6.88	7.11	7.33	7.56	7.79	8.02	8.25	8.48	8.71	8.94	9.17	9.63	10.08	10.54	11.00
12.....	6.25	6.50	6.75	7.00	7.25	7.50	7.75	8.00	8.25	8.50	8.75	9.00	9.25	9.50	9.75	10.00	10.50	11.00	11.50	12.00

ZERO REFRIGERATOR.



With WATER, WINE and MILK COOLER.
The Best Meat, Fruit and Ice Keeper in the World.
MAINTAINS THE PRE-EMINENCE.
40,000 Sold.
Grand Award of Merit by Centennial Exhibition.
TRADE SUPPLIED. SEND FOR CATALOGUE.

ROTUNDA FURNACE,



For Warming :

Public and Private Buildings.

DURABLE, POWERFUL,

ECONOMICAL.

FREE FROM GAS.

Diploma given by the American Institute, 1881 and 1882.

ALEX. M. LESLEY, Manufacturer,
1343 Broadway, bet. 35th & 36th Sts.,
NEW YORK.

Population of the United States.

CENSUS OF 1880.

Alabama	1,262,344	Ohio	3,197,794
Arkansas	802,564	Oregon	174,767
California	864,686	Pennsylvania	4,282,738
Colorado	194,649	Rhode Island	276,528
Connecticut	622,683	South Carolina	995,706
Delaware	146,654	Tennessee	1,542,463
Florida	266,566	Texas	1,597,509
Georgia	1,538,983	Vermont	332,286
Illinois	3,078,636	Virginia	1,512,203
Indiana	1,978,358	West Virginia	618,193
Iowa	1,624,463	Wisconsin	1,315,586
Kansas	995,335		
Kentucky	1,648 599	Total States	49,369,965
Louisiana	940,263	THE TERRITORIES.	
Maine	648,945	Alaska	
Maryland	935,139	Arizona	40,441
Massachusetts	1,783,086	Dakota	134,582
Michigan	1,634,096	Dist. of Columbia	177,624
Minnesota	780,807	Idaho	32,611
Mississippi	1,131,899	Montana	39,157
Missouri	2,169,091	New Mexico	118,430
Nebraska	452,432	Utah	143,907
Nevada	62,265	Washington	75,120
New Hampshire	347,784	Wyoming	20,788
New Jersey	1,130,892	Total Territories	782, 594
New York	5,083,173	Total U. S	50,152,554
North Carolina	1,400,000		

Population of the Principal Cities.

Cities having a population of 30,000 and upward, according to the United States Census of 1880.

Rank.			Rank.		
21	Albany, N. Y	90,903	38	Minneapolis, Minn	46,887
23	Allegheney, Pa	78,681	60	Mobile, Ala	31,205
51	Atlanta, Ga	34,398	40	Nashville, Tenn	43,461
7	Baltimore, Md	332,190	15	Newark, N. J	136,400
5	Boston, Mass	362,535	26	New Haven, Conn	62,882
3	Brooklyn, N. Y	566,689	10	New Orleans, La	216,140
13	Buffalo, N. Y	155,137	1	New York, N. Y	1,206,590
31	Cambridge, Mass	52,740	50	Oakland, Cal	34,556
44	Camden, N. J	41,658	64	Omaha, Neb	30,518
36	Charleston, S. C	49,999	34	Paterson, N. J	50,887
4	Chicago, Ill	503,304	2	Philadelphia, Pa	846,984
8	Cincinnati, Ohio	255,708	12	Pittsburgh, Pa	156,381
11	Cleveland, Ohio	160,142	53	Portland, Me	33,810
33	Columbus, Ohio	51,665	20	Providence, R. I	104,850
47	Dayton, Ohio	38,677	41	Reading, Pa	43,280
49	Denver, Col	35,630	25	Richmond, Va	63,833
18	Detroit, Mich	116,342	22	Rochester, N. Y	89,366
37	Fall River, Mass	49,006	9	San Francisco, Cal	233,956
58	Grand Rapids, Mich	32,015	63	Savannah, Ga	30,681
62	Harrisburg, Pa	30,762	39	Scranton, Pa	45,850
42	Hartford, Conn	42,553	55	Springfield, Mass	33,340
61	Hoboken, N.J	30,999	57	St. Joseph, Mo	32,434
24	Indianapolis, Ind	75,074	6	St Louis, Mo	350,522
17	Jersey City, N J	120,728	45	St. Paul, Minn	41,498
30	Kansas City, Mo	55,813	32	Syracuse, N. Y	51,791
46	Lawrence, Mass	39,178	3	Toledo, Ohio	50,143
16	Louisville, Ky	123,645	29	Troy, N. Y	56,747
27	Lowell, Mass	59,485	52	Utica, N. Y	35,913
48	Lynn, Mass	38,284	14	Washington, D. C	147,307
56	Manchester, N H	32,630	59	Wheeling, W Va	31,266
54	Memphis, Tenn	33,593	43	Wilmington, Del	42,499
19	Milwaukee, Wis	115,578	28	Worcester, Mass	58,295

NORTHAMPTON CUTLERY CO.,

NORTHAMPTON, Mass.

MANUFACTURERS OF

SUPERIOR TABLE CUTLERY

OF EVERY DESCRIPTION,

WITH { COCOA, EBONY, BONE, RUBBER, CELLULOID, IVORY & PLATED. } HANDLES.

INCLUDING AN ASSORTMENT OF

CARVERS, WITH PATENT GUARD FORKS,

of the latest and most approved designs.

FRENCH COOKS' KNIVES,

Tempered and ground especially for Professional use.

Butcher, Sticking and Skinning Knives

In all the usual styles of perfect finish and guaranteed quality.

A full Assortment of these very Desirable Goods

CAN BE OBTAINED FROM

QUACKENBUSH. TOWNSEND & CO.,

No. 85 CHAMBERS and 67 READE STS., or

WILLIAM BRYCE & CO.,

29 CHAMBERS ST.,

NEW YORK.

Poisons and their Antidotes.

ARSENIC.—Use the stomach pump instantly; otherwise, give 20 grains sulphate of zinc in a little warm water to produce vomiting, or a large table spoonful of mustard in warm water. Meanwhile procure some *hydrated sesquioxide of iron* and give a tablespoonful of it with water every five or ten minutes until six doses are taken. *Dialyzed iron* is also efficient.

AQUA AMMONIA, or HARTSHORN, if taken undiluted is a violent poison. Give *Vinegar*, instantly, mixed with a little water, this acts by neutralization. Vegetable oils, in large quantity, furnish the next best antidote, the ammonia acting upon them to form Soap.

ACONITE.—Give an emetic of mustard or sulphate of zinc, or use the stomach pump, instantly, then give stimulants, whiskey, brandy, gin or rum, &c.

ACID—NITRIC, MURIATIC, or SULPHURIC.—If either of these be swallowed, not a moment is to be lost. The best remedy is to fill the patient FULL of *Calcined Magnesia* stirred up in water, to the consistency of very thin paste; or, give half an ounce of soap shavings in a pint of water. If neither are at hand give chalk or whiting, in water, or even pound fine some of the white plastering from the wall and give in water

BELLADONNA, HYOSCYAMUS, STAMONIUM, and CONIUM are all narcotics, and the treatment is the same as for opium; *especially the strong coffee.*

CANTHARIDES (Spanish Flies).—Give large doses of sweet oil, sugar and water, or milk. To relieve the strangury and scalding of urine which it occasions, give camphor, 10 to 15 drop doses in water.

CORROSIVE SUBLIMATE, (Bed bug poison).—Mix up quickly the *whites of a dozen eggs*, with a quart of cold water, give a cupful of the mixture every two minutes till the stomach can hold no more. If you have not eggs enough use what you have and make up the deficiency with *milk*. Wheat flour, mixed with water, is good. Use the stomach pump if it can be had quickly.

CHARCOAL GAS, SULPHURETTED HYDROGEN, or CARBONIC ACID GAS.—Use cold shower bath and give Aconite in drop doses, in a spoonful of water. The effects of *Coal gas* are best antidoted by copious draughts of vinegar and water.

OXALIC ACID.—Give *Magnesia* in water as quickly as possible. When not to be had, use chalk, lime or saleratus. Use the stomach pump if at hand. Soap suds or alkalies are of no use with this Acid.

OPIUM, MORPHINE and LAUDANUM.—Use the stomach pump, if possible; if not, a powerful emetic, as sulphate of zinc; or, give the mustard emetic and tickle the palate. If drowsiness comes on, take the patient into the open air; dash water into the face, *by all means keep him walking.* If once allowed to fall asleep it may be impossible to arouse him. Strong coffee, taken hot, antidotes after the stomach has been emptied.

PRUSSIC ACID.—This is the deadliest of all known poisons. One drop of the *pure acid* will cause instantaneous death. If any of its products be taken and the result is not immediately fatal, resort to the cold shower bath, inhalation of diluted *aqua ammonia* vapor and give solution of carbonate of potass, 20 grains to a glass of water, or ammonia diluted with six times the bulk of water, freely.

SUGAR OF LEAD, (Acetate of Lead).—Give a ground mustard emetic; or, 20 grains sulphate of zinc in a glass of water; afterwards, large dose of epsom salts.

STRYCHNINE or NUX VOMICA, are rapid and deadly poisons, generally proving fatal, in spite of treatment. If emetics are given and the stomach emptied quickly enough, and if the patient is not attacked with convulsions within two hours, he will generally be safe. An abundance of sweet milk is recommended, also strong coffee, as for opium poisoning.

STRONG LYE.—Sometimes swallowed by children. The remedy is *vinegar, or oil*, the former by converting the lye into acetate of potash, the latter by forming soap; neither of which materially injures the stomach.

VERDIGRIS.—This most frequently poisons by its formation upon copper vessels used in cooking. Give an *emetic* instantly, and then two teaspoonful of *Carbonate of Soda*, in a tumbler full of water and repeat in ten minutes. Whites of eggs in water are also proper.

A. B. & W. T. WESTERVELT,

102 CHAMBERS STREET.

Corner Church Street, *NEW YORK,*

— MANUFACTURERS OF —

Ornamental Iron, Copper and Zinc Work.

COPPER WEATHER VANES AND BANNERETS.

NEWEST AND MOST APPROVED DESIGNS.

Wrought and Cast Iron
Railings
Door and Window
GUARDS.



Plain and Ornamental
DRIVEWAY GATES.

WIRE WORK

Of every description for Banks, Offices, &c.

LAMPS and LAMP POSTS.

Fountains.
Aquaria,
Fountain Jets.
Garden Vases.
Statuary.
Chairs and Settees.
Tables.
Archways.
Iron & Brass Bedsteads.
Copper and Galvanized Iron Lightning Rods.

CAST IRON CRESTINGS, FINIALS and BANNERETS,

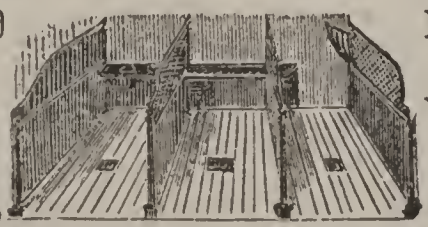
FOR HOUSES, CHURCHES, TOWERS AND PUBLIC BUILDINGS.

HAND AND HORSE LAWN MOWERS AND GARDEN ROLLERS.

Galvanized Railings for Cemetery Enclosures.

Emblematic Signs for Various Trades.

IRON, BRASS and NICKEL PLATED
Stable Fittings,
SUCH AS
Guards, Mangers,
Racks, Gutter, Posts,



Hooks, Tie Rings,
Water Troughs,
Wood Covered Brackets,
Whip Racks, &c. &c.

SPECIAL ATTENTION GIVEN TO ARCHITECTS DRAWINGS.

Illustrated Catalogues furnished to Architects, Builders and the Trade.

Office and Warerooms, 102 CHAMBERS ST., cor. Church, New York.

WEIGHTS AND MEASURES.

Avoirdupois Weight.

The Grain is the same in Troy, Apothecaries and Avoidupois Weights.

The standard avoirdupois pound is the weight of 27.7015 cubic inches of distilled water weighed in the air at 35.85 degrees Fahr., barometer at 30 inches.

27.343 grains = 1 drachm.

drachms.	ozs.	lbs.	qrs.	cwt.	ton.	French grammes.
1 =	.0625 =	.0039 =	.000139 =	.000035 =	.00000174 =	1.771846
16 =	1 =	.0625 =	.00223 =	.000558 =	.000028 =	28.34954
256 =	16 =	1 =	.0357 =	.00893 =	.000447 =	453.59
7168 =	448 =	28 = 1	=	.25 =	.0125 =	12700
28672 =	1792 =	112 = 4	= 1	=	.05 =	50802
573440 =	35840 =	2240 = 80	= 20	= 1	=	1016040

A stone = 14 pounds. A quintal = 160 pounds

Troy Weight.

For Gold, Silver and Precious Metals.

grains.	dwts.	ozs.	lbs.	French grammes.
1 =	.04167 =	.00208 =	.0001736 =	.9648
24 =	1 =	.05 =	.004167 =	1.555
480 =	20 =	1 =	.0833 =	31.1035
5760 =	240 =	12 =	1 =	373.242

175 lbs. Troy = 144 Avoirdupois.
lbs. Avoirdupois X .8286 = lbs. Troy.
lbs. Troy X 1.2153 = lbs. Avoirdupois.

The jeweler's Carat is equal, in the United States, to 3.2 grains; in London, to 3.17 grains; in Paris, to 3.18.

Pure Gold is worth $20.67 per oz. Troy, or $18.84 per oz. Avoirdupois.
" Silver " $1.36 " " $1.24 " "
Standard Gold " $18.60 " " $16.96 " "
" Silver " $1.225 " " $1.117 " "

Apothecaries' Weight.

United States and British.

20 grains..... 1 scruple.
3 scruples..... 1 drachm = 60 grains.
8 drams..... 1 ounce = 24 scruples = 480 grains.
12 ounces..... 1 pound = 96 drachms = 288 scruples = 5760 grs.

In Troy and Apothecaries' weights, the grain, ounce and pound are the same.

Long Measure.

ins.	feet.	yards.	fath.	poles.	furl.	mile.	French metres.
1 =	.083 =	.02778 =	.0139 =	.005 =	.000126 =	.0000158 =	.0254
12 =	1 =	.333 =	.1667 =	.0606 =	.00151 =	.0001894 =	.3048
36 =	3 =	1 =	5 =	.182 =	.00454 =	.000568 =	.9144
72 =	6 =	2 =	1 =	.364 =	.0091 =	.001136 =	1.8287
198 =	16½ =	5½ =	2¾ =	1 =	.025 =	.003125 =	5.0291
7920 =	660 =	220 =	110 =	40 =	1 =	.125 =	201.16
63360 =	5280 =	1760 =	880 =	320 =	8 =	1 =	1609.315

A cable's length = 120 fathoms.

A square mile is 640 acres.
A league is three miles.
The term "Sabbath Day's Journey" means 1,155 yards.
A day's journey is 33⅓ miles.
A fathom is six feet.

A hand (horse measure) is four inches.
A palm is three inches.
A span is 10⅞ inches.
A cubit is two feet.
A great cubit is 11 feet.
A pace is three feet.

Surveying Measure (Lineal).

ins.	links.	feet.	yards.	chains.	mile.	French metres.
1 =	.126 =	.0833 =	.0278 =	.00126 =	.0000158 =	.0254
7.92 =	1 =	.66 =	.22 =	.01 =	.000125 =	.2012
12 =	1.515 =	1 =	.333 =	.01515 =	.000189 =	.3048
36 =	4.545 =	3 =	1 =	.04505 =	.000568 =	.9144
792 =	100 =	66 =	22 =	1 =	.0125 =	20.116
63360 =	8000 =	5280 =	1760 =	80 =	1 =	1609.315

1 knot or geographical mile = 6082.66 feet = 1854 metres = 1.152 statute mile.
1 Admiralty knot = 1.1515 statute miles = 6080 feet.

Table of Quantities.

12 units or articles,	1 dozen.	20 quires	1 ream.
12 dozen	1 gross.	2 reams	1 bundle.
20 units or articles,	1 score.	5 bundles	1 bale.
24 sheets paper,	1 quire.	Printer's token,	250 sheets.

GRAHAM & HAINES,

P. O. Box 1042. 113 Chambers & 95 Reade Streets, N. Y.

HARDWARE MANUFACTURERS' AGENTS,

AS FOLLOWS.

HENRY DISSTON & SONS, Saws, Files, &c.
HOWARD BROS., Cotton, Wool and Curry Cards.
DERBY & BALL, Scythe Snaths.
OTSEGO FORK MILLS, Steel Forks, Rakes, Hoes, &c.
E. KNICKERBACKER, Scythes, Axes and Tools.
HENRY W. KIP, Nail Hammers.
IRON CITY TOOL WORKS (Limited), Vises, Picks, Mattocks, Grub Hoes, &c.
DETROIT BLOCK WORKS, Tackle Blocks.
PHENIX CASTER CO., Martin's Patent Caster.
NIMICK & BRITTAN MFG. CO., Locks, &c.
SANDUSKY TOOL CO., Planes and Plane Irons.
OHIO TOOL CO., " " "
AUBURN TOOL CO., " " "
GEO. M. EDDY & CO., Measuring Tapes.
MILES' Alarm Money Drawer.
NORTHWESTERN HORSE NAIL CO., Horse Nails.
A. G. COES & CO.. Coes' Genuine Screw Wrenches.
W. H. HOWELL, Geneva Hand Fluters.
SEDGWICK MFG. CO., Butter and Flour Tryers, &c.
SCANDINAVIAN PADLOCKS.
BEST OF ALL EGG-BEATERS.
RIPLEY MFG. CO., Mouse Traps.
SAM'L LORING, Plymouth Tack and Rivet Works.
J. BARTLES & CO., Sand and Emery Paper.
PORTER MFG. CO., Window and Door Screen Corners.
PAYSON MFG. CO., Perfect Sash Lock.
J. MALLINSON, Cast Steel Shears and Scissors.
KETCHAM'S Patent Metallic Sieves.
R. S. CLARK, Hand and Sleigh Bells.
P. LOWENTRAUT, Compasses, Calipers, Dividers, &c.
CLARK BROS. & CO., Carriage Bolts, &c.
LOWERRE & TUCKER, The Genuine Knox Fluting Machine.
A. N. BRAGG & CO., N. Y. & Ger. Snaps.
KENTUCKY BELL CO., "Dodge's" Kentucky Cow Bells.
G. & H. Eureka Family Glue Pot and Furnace.
LANE BROS., Swift's and Grocers' Coffee Mills and Measuring Faucets, &c.
T. C. RICHARDS HARDWARE CO., Bright Wire Goods. Picture Nails, &c.
WM. FLACCUS & SON, Bellows.
J. HAISH & CO., "S" Barb Steel Fence Wire.
HOLMES & EDWARDS' Plated Spoons and Forks.
WM. WILKINSON'S ANVILS.
NEW HAVEN COPPER CO., Augers and Auger Bits.
H. B. IVES. Ives' Patent Door Bolts.

WEIGHTS AND MEASURES—Continued.

Square Measure.

ins.		feet.		yards.		perches.		roods.		acre.		Square metres.
1	=	.00694	=	.000772	=	.0000255	=	.00000064	=	.000000159	=	.000645
144	=	1	=	.111	=	.00367	=	.0000918	=	.000023	=	.0929
1296	=	9	=	1	=	.0331	=	.000826	=	.0002062	=	.8361
39204	=	272¼	=	30¼	=	1	=	.025	=	.00625	=	25.292
1568160	=	10890	=	1210	=	40	=	1	=	.25	=	1011.7
6272640	=	43560	=	4840	=	160	=	4	=	1	=	4046.7

100 square feet = 1 square.
1 chain wide = 8 acres per mile.
10 square chains = 1 acre.
1 hectare = 2.471143 acres.
1 square mile. = 2787400 sq. feet. = 3097600 sq. yds. = 640 acres.
Acres x .0015625 = square miles.
Sq. yds. x .000000323 = sq. miles.

A section of land is 1 mile square, and contains 640 acres
A square acre is 208.71 feet at each side.
" ½ " 147.58 " "
" ¼ " 104.355 " "
A circular " 235.504 feet in diameter.
" ½ " 166.527 " "
" ¼ " 117.752 " "

52 1-6	feet	square,	or.....	2.722½	square	feet	is	1-16 acre.
73²⁄₃	feet	square,	or.....	5,445	square	feet	is	⅛ acre.
104⅓	feet	square,	or.....	10,890	square	feet	is	¼ acre.
120⅝	feet	square,	or.....	14,520	square	feet	is	⅓ acre.
147½	feet	square,	or.....	21,780	square	feet	is	½ acre.
208⅔	feet	square,	or.....	43,560	square	feet	is	1 acre.

Cubic Measure.

ins.		feet.		yard.		cubic metres.
1	=	.0005788	=	.000002144	=	.000016386
172⅘	=	1	=	.03704	=	.028315
46656	=	27	=	1	=	.764513

A cord of wood = 128 cubic feet, being 4 feet high, 4 feet wide, and 8 feet long.
42 cubic feet = a ton of shipping.

A Cubic Foot is Equal to

1728 cubic inches.
.037037 cubic yard.
.803564 U. S. struck bushel of 2150.42 cubic inches.
3.21426 U. S. pecks.
7.48052 U. S. liquid galls. of 231 cub. inch.
6.42851 U. S. dry gallons.
29.92208 U. S. liquid quarts.
25.71405 U. S. dry quarts.
59.84416 U. S. liquid pints.
51.42809 U. S. dry pints.
239.37662 U. S. gills.
.26667 flour barrel of 3 struck bushels.
.25748 U. S. liquid barrel of 31½ gallons.

Dry Measure.

The Standard Bushel contains 2150.42 cubic inches, or 77.627013 pounds avoirdupois of pure water at maximum density. It legal dimensions are 18½ inches Diameter inside, 19½ inches outside, and 8 inches deep; and when heaped, the cone must be 6 inches high, making a heaped bushel equal to 1¼ struck ones.

Pints.		Quarts.		Gallons.		Pecks.		Bushels.		Cubic Inches.
2	=	1	=	.250	=	.125	=	.0315	=	67.2
8	=	4	=	1	=	.5	=	.125	=	268.8
16	=	8	=	2	=	1	=	25	=	537.6
64	=	32	=	8	=	4	=	1	=	2150.42

Liquid Measure.

The standard gallon measures 231 cubic inches, or 8.33888 lbs., avoirdupois of pure water, at about 39.85 degrees Fahr., the barometer at 30 inches.

gills.												
4	=	1 pint.										
8	=	2	=	1 quart.								
32	=	8	=	4	=	1 gallon.						
1344	=	336	=	168	=	42	=	1 tierce.				
2016	=	504	=	252	=	63	=	1½	=	1 hogshead.		
2688	=	672	=	336	=	84	=	2	=	1⅓	=	1 puncheon.
4032	=	1008	=	504	=	126	=	3	=	2	=	1½ = 1 pipe.
8064	=	2016	=	1008	=	252	=	6	=	4	=	3 = 2 = 1 tun.

A cubic foot contains 7½ gallons.

C. E. JENNINGS & CO.,

MANUFACTURERS OF

Mechanics' Tools,

AND AGENTS FOR

AMERICAN HARDWARE.

FACTORY:
CHESTER, Conn.

OFFICE:
96 Chambers Street,
NEW YORK.

THE PATENT SOLID HEAD AUGER BIT.

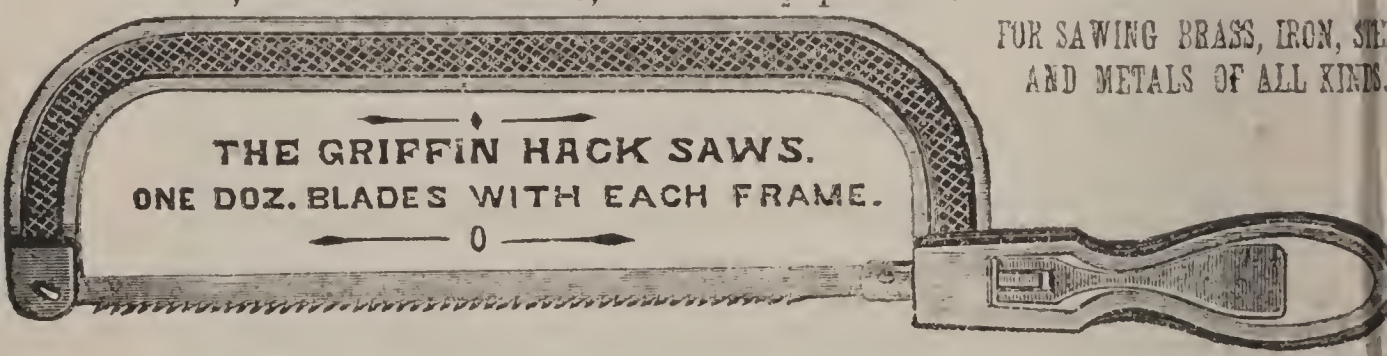


The SOLID HEAD guarantees a PERFECTLY STRAIGHT hole. In cross grain boring, knots, or the end of the timber, its superiority is seen.

	4	5	6	7	8	9	10	11	16ths
List, per doz...	$3.20	3.60	4.00	4.60	5.00	5.40.	5.80	6.40	

	12	13	14	15	16	16ths
List, per doz....	$7.00	7.60	8.20	8.80	9.40	

Also, in sets assorted—18, 24 and 32½ quarters.



Frames Complete, with One Dozen Blades.

Inch.....	6	7	8	9
List, per Dozen.....	$14.00	15.00	16.00	17.00

Extra Hack Saw Blades.

Inch.....	6	7	8	9
List, per Gross.....	$7.00	7.50	8.00	8.50

An improvement over all others in that it performs the same work with a great saving of expense, time, and annoyance. As shown in the cut, the Blade is secured in place by two pins, and may be readily detached. The tension is regulated by a lever in the open handle. The Blades are very highly tempered and require no filing. As the cost is far less than was formerly paid for filing alone, they may be thrown away when dull. Samples sent for inspection of the Trade on receipt of price. 8 inch Frame, with extra Blades, $1.50 each. Postage prepaid.

☞ Illustrated Catalogues sent on application. ☜

THE METRIC SYSTEM.

WEIGHTS.

Metric Denominations and values.			Equivalents in Denominations in use
Names.	No. Grams.	Weight of what quantity of water at maximum density.	Avoirdupois Weight.
Millier or tonneau	1,000,000	1 cubic meter	2204.6 pounds
Quintal	100,000	1 hectoliter	220.46 pounds
Myriagram	10,000	10 liters	22.046 pounds
Kilogram or kilo	1,000	1 liter	2.2046 pounds
Hectogram	100	1 deciliter	3.5274 ounces.
Dekagram	10	10 c. centimeter	0.3527 ounce.
Gram	1	1 c. centimeter	15.432 grains.
Decigram	.1	.1 c. centimeter	1.5432 grains.
Centigram	.01	10 c. millimeter	0.1543 grain.
Milligram	.001	1 c. millimeter	0.0154 grain.

MEASURES OF LENGTH.

Metric Denominations and Values.		Equivalents in Denominations in use.
Myriameter	10,000 meters	6.2137 miles.
Kilometer	1,000 meters	0.62137 m. or 3,280 feet 10 inches.
Hectometer	100 meters	328 feet and 1 inch.
Dekameter	10 meters	393.7 inches.
Meter	1 meter	39.37 inches.
Decimeter	.1 of a meter	3.937 inches.
Centimeter	.01 of a meter	0.3937 inch.
Millimeter	.001 of a meter	0.0394 inch.

MEASURES OF SURFACE.

Metric Denominations and Values.		Equivalents in Denomination in use.
Hectare	10,000 square meters	2.471 acres.
Are	100 square meters	119.6 square yards.
Centare	1 square meter	1.550 square inches.

MEASURES OF CAPACITY.

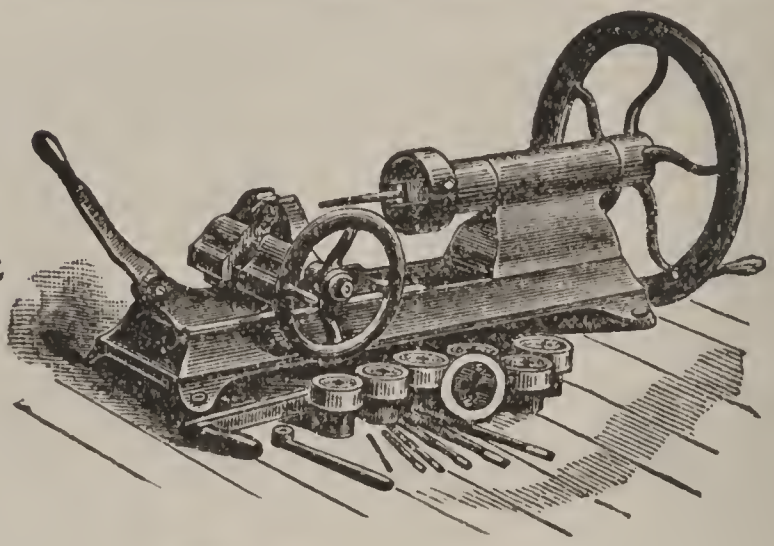
Metric Denominations and Values.			Equivalents in Denominations in use.	
Names.	No. Liters.	Cubic Measure.	Dry Measure.	Wine Measure.
Kiloliter	1,000	1 cubic meter	1.308 cubic yards	264.17 gallons.
Hectoliter	100	.1 cubit meter	2 bush. 3.35 pks.	26.417 gallons.
Decaliter	10	10 c. decimeters	9.08 quarts	2.6417 gallons.
Liter	1	1 c. decimeter	0.908 quart	1.0567 quarts
Deciliter	.1	.1 c. decimeter	6.1022 cubic inch.	0.845 gill.
Centiliter	.01	10 c.centimeters	0.6102 cubic inch.	0.338 fluid oz.
Milliliter	.001	1 c. centimeter	0.061 cubic inches	0.27 fluid dr.

WILEY & RUSSELL MF'G COMPAN

GREENFIELD, Mass.

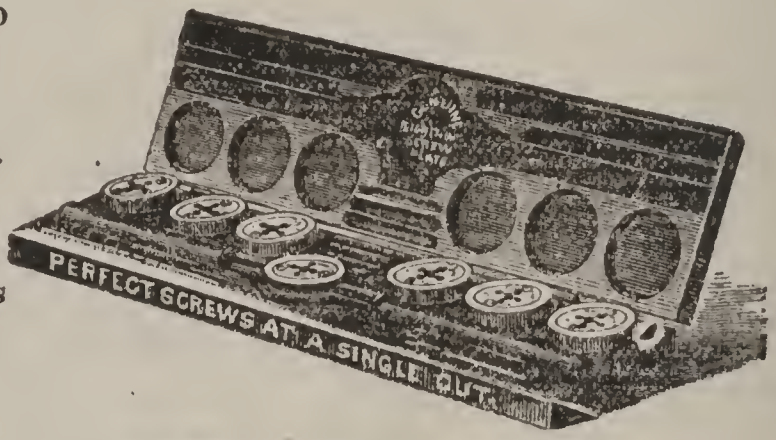
Patent Screw-Cutting and other Labor-Saving Tools.

BOLT CUTTERS
FOR
HAND & POWER
USE
IN GREAT VARIETY.



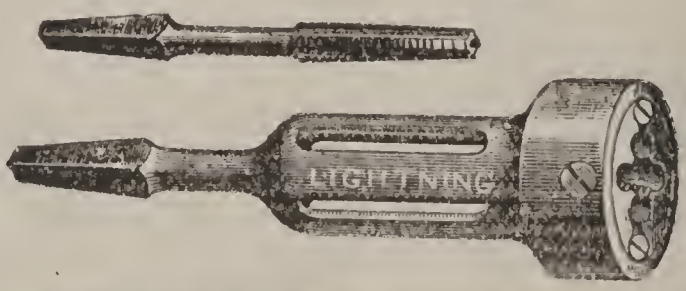
GREEN RIV
DRILLING
MACHINES
PUNCHING
PRESSES.

THE CELEBRATED
LIGHTNING
SCREW PLATE.
CUTTING
FROM WIRE SIZES
To 1½ in. Diam.



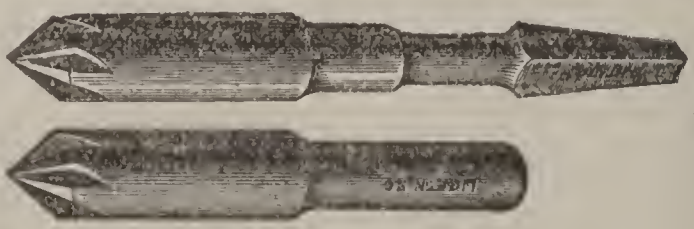
TIRE
UPSETTER
TIRE BENDE
HORSE SHO
VISES.

TAPS AND DIES
OF
FINEST QUALITY.

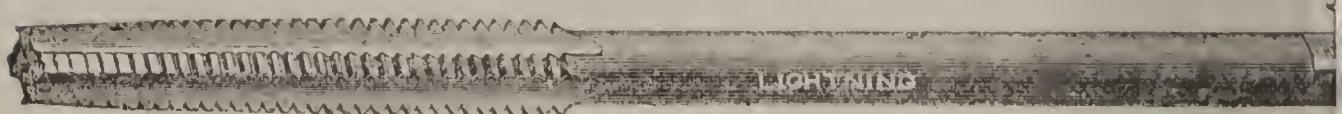


TIRE
MEASURING
WHE
&c., &c.

REAMERS,
COUNTERSINKS,
&c., &c.



SEND FOR
ILLUSTRATED
PRICE L



Brokers' Technicalities.

A BULL is one who operates to depress the value of stocks, that he may buy for a rise.

A BEAR is one who sells stocks for future delivery, which he does not own at the time of sale.

A CORNER is when the Bears cannot buy or borrow the stock to deliver in fulfillment of their contracts.

OVERLOADED is when the bulls cannot take and pay for the stock they have purchased.

SHORT is when a person or party sells stock when they have none, and expect to buy or borrow in time to deliver.

LONG is when a person or party has a plentiful supply of stocks.

A POOL or RING is a combination formed to control the price of stocks.

A broker is said to CARRY stocks for his customer when he has bought and is holding it for his account.

A WASH is a pretended sale by special agreement between buyer and seller, for the purpose of getting a quotation reported.

A PUT and CALL is when a person gives so much per cent. for the option of buying or selling so much stock on a certain fixed day, at a price fixed the day the option is given.

Railway Signals.

One pull of bell-cord signifies "stop."
Two pulls means "go ahead."
Three pulls means "back up."
One whistle signifies "down-brakes."
Two whistles signifies "off-brakes."
Three whistles means "back up."
Continued whistles indicate "danger."
Short rapid whistles, "a cattle alarm."

A sweeping parting of the hands on a level with the eyes means "go ahead."

A slowly sweeping meeting of the hands over the head signifies "back slowly."

A downward motion of the hands, with extended arms, signifies "stop."

A beckoning motion with one hand indicates "back."

A red flag waved up the track indicates "danger."

A red flag by the roadside means "danger ahead."

A red flag carried on a locomotive signifies "an engine following."

A red flag raised at a station means "stop."

A lantern swung at right angles across the track means "stop."

A lantern raised and lowered vertically is a signal to "start."

A lantern swung in a circle signifies "back the train."

WIEBUSCH & HILGER

Hardware Co.,

Manufacturers and Importers of

HARDWARE

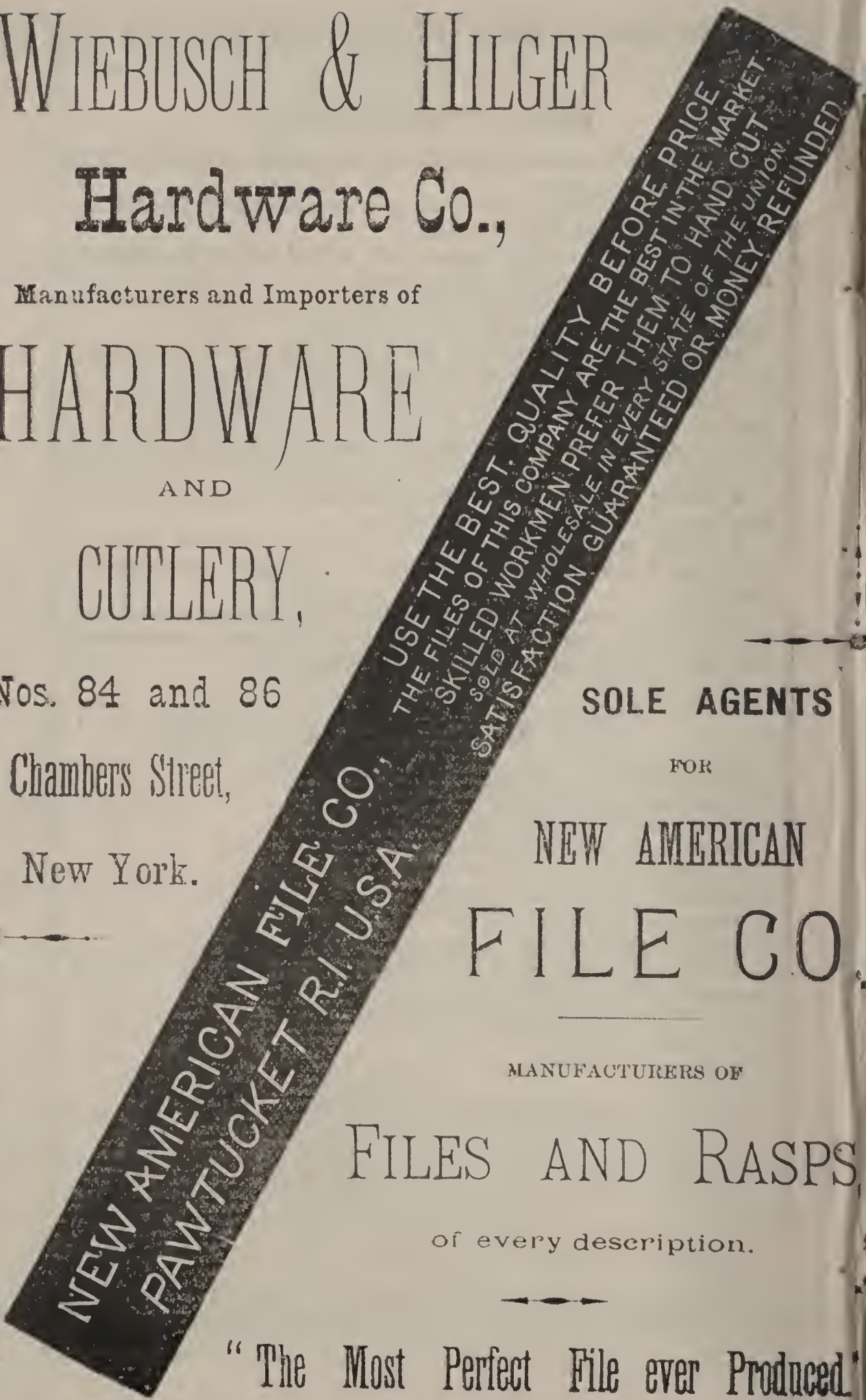
AND

CUTLERY,

Nos. 84 and 86

Chambers Street,

New York.



SOLE AGENTS

FOR

NEW AMERICAN

FILE CO.

MANUFACTURERS OF

FILES AND RASPS,

of every description.

"The Most Perfect File ever Produced."

REGULAR STANDARD SIZES OF FILES.

WIDTH, AND THICKNESS BY WIRE GAUGE.

L'ngth Inches.	Mill Saw.	Flat.	Hand.	Half Round.	R'nd & Square	Cabinet Files.	Regular Tapers.	Slim Tapers.	Pit Saw Files.	Warding
	Gauge.	Gauge.	Gauge.	Gauge.		Gauge.				Gauge.
3	7-16x16	5-16x16	5-16x13	5-16x13	1-8		1-4	3-16		13-32x17
3 1-2							9-32	1-4		7-16x17
4	15-32x15	7-16x15	7-16x10	13-32x11	1-8		23-64	1-4	9-32x 5-32	15-32x16
4 1-2							13-32	9-32	5-16x11-64	1-2 x16
5	1-2 x14	1-2 x12	9-16x8	1-2 x8	3-16		7-16	5-16	11-32x 3-16	17-32x15
5 1-2							15-32	9-32	3-8 x 1-4	9-32x15
6	5-8 x12	5-8 x9	11-16x7	19-32x7 Inch.	7-32	5-8 x9	1-2	9-32	13-32x17-64	5-8 x14
7	3-4 x10	11-16x6	3-4 x5	3-4 x13-64	1-4	3-4 x7	9-16	7-16	7-16x 9 32	
8	13-16x8	13-16x5	7-8 x4	13-16x16-64	9-32	7-8 x6	5-8	1-2	1-2 x 5-16	
9	7-8 x8	7-8 x4	15-16x3	15-16x 1-4	5-16	1 x5				
10	1 x7	1 x3	1 1-8 x2	1 x17-64	3-8	13-32x4				
11	1 3-32x6	1 1-8 x2	1 3-16x1 Inch.	13-32x 5-16	7-16	13-16x3				
12	1 3-16x5	1 3-16x1 Inch.	1 1-4 x 5-16	1 3-16 x 5-16	1-2	1 1-4 x3				
13	1 1-4 x4	1 1-4 x 5-16	1 11-32x11-32	1 3-16 x 3-8	9-16					
14	1 11-32x3	1 11-32x11-32	1 7-16x 3-8	1 3-8 x13-32	5-8					
15	1 7-16x2	1 7-16x 3-8	1 1-2 x13-32	1 1-2 x 7-16	11-16					
16	1 1-2 x1	1 1-2 x13-32	1 9-16x 7-16	1 9-16x15-32	3-4					

This table will give consumers an idea of the sizes of the full parts of Files mostly used. Those who want files of a certain width or thickness can select more readily and know the corresponding length.

RICHARDSON'S CELEBRATED SAWS

Are Unequalled for Quality, Temper and Workmanship. Taper Ground, Thin at Back, and Perfectly True.

AND HAVE JUSTLY ATTAINED AN ENVIABLE REPUTATION.

WE MAKE A FULL LINE OF

HAND, PANEL, RIP, BACK,
COMPASS, BUTCHERS', CIRCULAR, MILL, and

CROSS CUT SAWS.

Illustrated Catalogue sent on application.



Richardson's Trade Mark.

A Maltese Cross, with the letters BEST, emblematical of the Standing of the Saws in the Trade.



SPECIAL SAWS, OR ANY SAWS NOT IN OUR LIST, MADE TO ORDER.

Richardson's Saw Works, 15 to 27 River St., Newark, N. J., U.S.A.

Standard Sizes of Circular Saw Mandrels.

No.	Diameter of Pulley.	Face of Pulley.	Diameter of Flange.	Length of Shaft.	Diameter of Shaft.	Size of Hole in Saw.
1	2½ ins.	3½ ins.	2½ ins.	14 ins.	1 1-16 in	1 in.
2	3 "	4 "	3 "	16 "	1 3-16 "	1⅛ "
3	3½ "	4½ "	3½ "	18 "	1 5-16 "	1¼ "
4	4 "	5 "	4 "	20 "	1 7-16 "	1 5-16 "
5	4½ "	5½ "	4½ "	22 "	1 7-16 "	1 5-16 "
6	5 "	6 "	5 "	24 "	1 7-16 "	1⅜ "
7	5½ "	6½ "	5½ "	26 "	1 7-16 "	1⅜ "
8	6 "	7 "	6 "	28 "	1 9-16 "	1½ "
9	7 "	8 "	6 "	32 "	1 11-16 "	1⅝ "
10	8 "	8 "	6 "	36 "	1 13-16 "	1⅝ "

When Ordering Circular Saws,

The following directions should be explicitly given:

Diameter of Saw in inches.
Thickness (or Gauge) of Saw at Rim.
Thickness (or Gauge) of Saw at Centre.
Log side, right or left hand, saw *cutting towards you.*
Number of Teeth in Saw.
Kind and number of Tooth.
Size of mandrel hole.
Size of pin hole.
Distance between pin holes from centre to centre.

Standard Gauges for Circular and Mill Saws.

Gauge.			Gauge.		
No. 4.....	¼ inch,	scant.	No. 11.....	⅛ inch,	scant.
" 5.....	7-32 "		" 12.....	3-32 "	full.
" 6.....	3-16 "	full.	" 13.....	3-32 "	scant.
" 7.....	3-16 "	scant.	" 14.....	5-64 "	full.
" 8.....	5-32 "		" 15.....	5-64 "	scant.
" 9.....	5-32 "	scant.	" 16.....	1-16 "	full.
" 10.....	⅛ "	full.			

CLEVELAND ROLLING MILL CO.,

CLEVELAND, OHIO.

MANUFACTURERS OF

IRON & STEEL WIRE,

OF ALL KINDS.

STEEL SPRING, PAIL BAIL AND MARKET WIRE,

WIRE FOR THE MANUFACTURE OF PINS, HAIR PINS AND CARD CLOTHING.

Gun Screw Wire, Machinery Wire,

Steel Carriage Tire and Forgings.

GALVANIZED and BLACK SHEET IRON.

IRON AND STEEL,

BOILER PLATES,

GIRDER and BRIDGE PLATES.

NEW YORK AGENTS:

DICKERSON, VAN DUSEN & CO.

NEW ENGLAND AGENTS:

John Wales & Co., Boston, Mass.

Size, Weight, Length and Strength of Iron Wire.

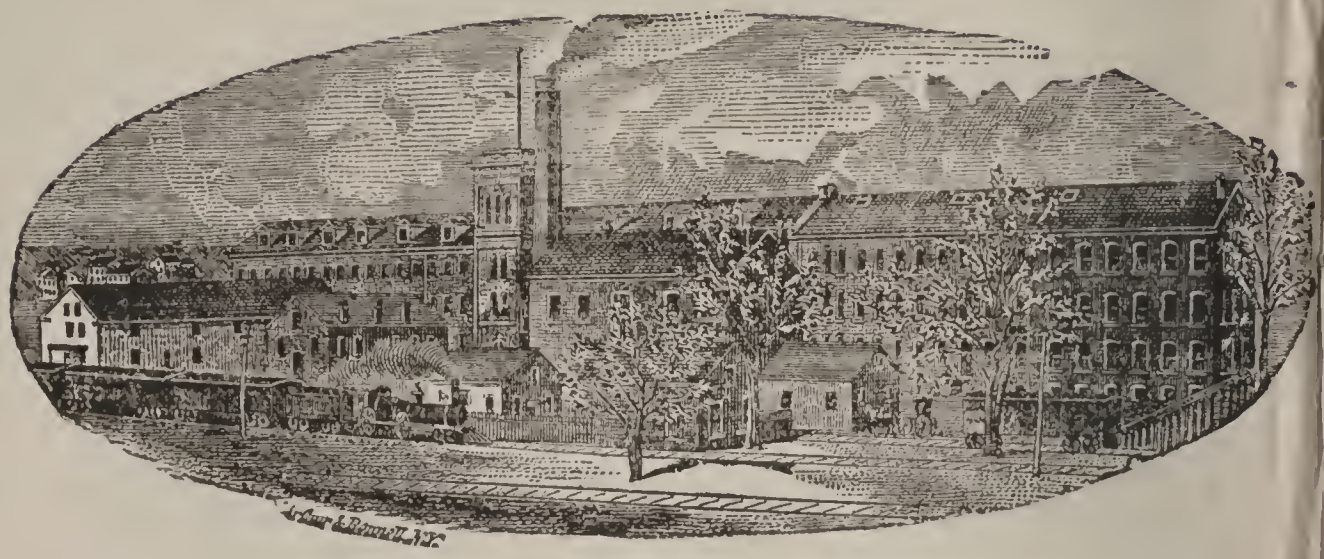
BIRMINGHAM WIRE GAUGE.

Wire Guage.	Diameter.	Weight of 100 Yards.	Weight of 1 mile.	Length of 1 Bundle.	Length of 1 Cwt.	Direct Strain.	
						Area of Section.	Breaking Weight.
No.	Inches.	Lbs.	Lbs.	Yards.	Yards.	Sq. in,	Lbs.
5-0	0 546	161 00	2830	39	70	0 163	13070
4-0	0 425	140 00	2460	45	80	0 142	11350
3-0	0 394	120 00	2113	52	93	0 122	9755
2-0	0 363	102 00	1794	62	110	0 103	8280
0	0 331	84 72	1490	74	132	0 086	6880
1	0 300	68 75	1210	91	162	0 071	5650
2	0 280	59 90	1054	105	187	0 062	4930
3	0 260	51 65	909	121	215	0 053	4250
4	0 240	44 00	775	143	255	0 045	3620
5	0 220	37 00	651	170	303	0 038	3040
6	0 200	30 56	538	203	361	0 031	2510
7	0 185	26 15	461	239	428	0 0265	2220
8	0 170	22 10	389	286	509	0 023	1840
9	0 155	18 36	323	342	609	0 0195	1560
10	0 140	14 97	264	420	717	0 016	1280
11	0 125	11 95	211	529	939	0 0125	1000
12	0 110	9 24	163	700	1244	0 010	800
13	0 095	7 05	124	893	1589	0 0071	568
14	0 085	5 51	97	1142	2031	0 0057	456
15	0 075	4 29	76	1468	2608	0 0044	352
16	0 065	3 22	57	1954	3473	0 0033	264
17	0 057	2 48	44	2540	4515	0 0026	208
18	0 050	1 91	34	3150	5600	0 0020	160
19	0 045	1 55	27	4085	7246	0 0016	128
20	0 040	1 22	21	4912	9168	0 0013	104
21	0 035	0 94	17	6416	11980	0 0010	80
22	0 030	0 69	12	8736	16300	0 0007	56

Sizes Expressed in Fractions of an Inch.

15-32 in.—No. 5-0 full
7-16 in.—No. 4-0 full
13-32 in.—No. 3-0 full
3-8 in.—No. 2-0 full
11-32 in.—No. 0 full
5-16 in.—No. 1 full.
9-32 in.—No. 2
1-4 in.—No. 3½
7-32 in.—No. 5
3-16 in.—No. 7
5-32 in.—No. 9
1-8 in —No. 11
1-10 in —No. 13 full
1-12 in —No. 14
1-16 in.—No. 16
1-32 in.—No. 22

THE STANLEY WORKS,



FACTORIES:

New Britain, Connecticut.

WAREHOUSE,

79 Chambers St.,

NEW YORK.



MANUFACTURERS

—OF—

Wrought Iron

BUTTS,

HINGES and DOOR BOLTS.

Goods furnished Plain, Galvanized, Japanned, Bronzed and Nickel Plate

APPROXIMATE WEIGHTS OF STRAP AND T HINGES.

Weight per dozen. Furnished by Stanley Works.

HEAVY STRAP HINGES.

Size....	4	5	6	8	10	12	14	16	ins.
Weight.	6¾	10½	19½	32¼	55¼	74½	89¼	108½	lbs.

EXTRA HEAVY T HINGES.

Size.....	6	8	10	12	14	16	ins.
Weight	20¾	34 ¾	54	78	83¼	87¾	lbs.

STRAP AND T HINGES ARE COUNTERSUNK FOR SCREWS.

Inches		3	4	5	6	8	10	12	14	16	18
Light Strap.....	Size Screws	6	7	8	9	10	10	12	13	13	
Heavy Strap.....	"		9	9	11	12	14	16	16	16	
Light T...	"	7	7	8	8	9	10	11	12		
Heavy T.....	"				9	10	11	12	13	13	13
Extra Heavy T	"			10	11	13	14	16	16	16	
Hinge Hasps.....	"	6	7		9	10	10	12			

WROUGHT BUTTS—Countersunk for Screws.

TABLE BUTTS AND BACK FLAPS.

Inches	⅞	1	1⅛	1¼	1⅜	1½	1⅝	1¾	2⅞	2
Size Screw.....	6	6	7	7	7	8	8	9	9	9

NARROW WROUGHT BUTTS.

Inches..	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	5½	6
Screws..	5	6	7	7	8	8	9	9	10	12	12	12	12	14	14	14	14

LIGHT NARROW AND LIGHT LOOSE PIN.

Inch	¾	1	1¼	1½	1¾	2	2¼	2½	3
Screws.....	2	3	3	5	5	6	6	6	7

LOOSE PIN OR BROAD.

Size.....	2x2 to 2½x2	2½x2½ to 3x3	3x3½	3½x3 to 4½x4	4½x4½ to 5½	5x5 to 6x7
Screws.....	9	10	11	12	13	14

CAST BUTTS

ARE COUNTERSUNK FOR SCREWS AS FOLLOWS:

NARROW, FAST OR LOOSE JOINT.

Inch.....	1½	1¾	2	2¼	2½	3	3¼	3½	4	4½	5	6
Screws	6	7	7	8	8	8	10	10	10	12	14	18

PARLIAMENT.

Inch.....	2½ to 3½	3¾ and 4	4½ to 7½	8 and 8½
Screw	8	10	11	13

BROAD, FAST, AND LOOSE JOINT AND LOOSE PIN.

Inch.....	2x2 to 2½x3	3x2½ to 3½x3½	3½x4
Screw	8	10	11

Inch	3½x5	4x3	4x3½ to 4½x4½	4½x5 and upwards
Screw.....	10	10	11	13

OAR FACTORIES.

MONTPELLIER, OHIO. CARROLLTON, MICH.
MORENCI, MICH. BRECKENRIDGE, MICH.

DE GRAUW, AYMAR & CO.

MANUFACTURERS
And
IMPORTERS OF

CORDAGE, OAKUM, WIRE ROPE,
OARS, BLOCKS, CHAINS, ANCHORS,

Bunting,

RUSSIA BOLT ROPE.

SHIP CHANDLERS' GOODS

GENERALLY

Nos 34 & 35 SOUTH STREET
NEW YORK.

TABLE

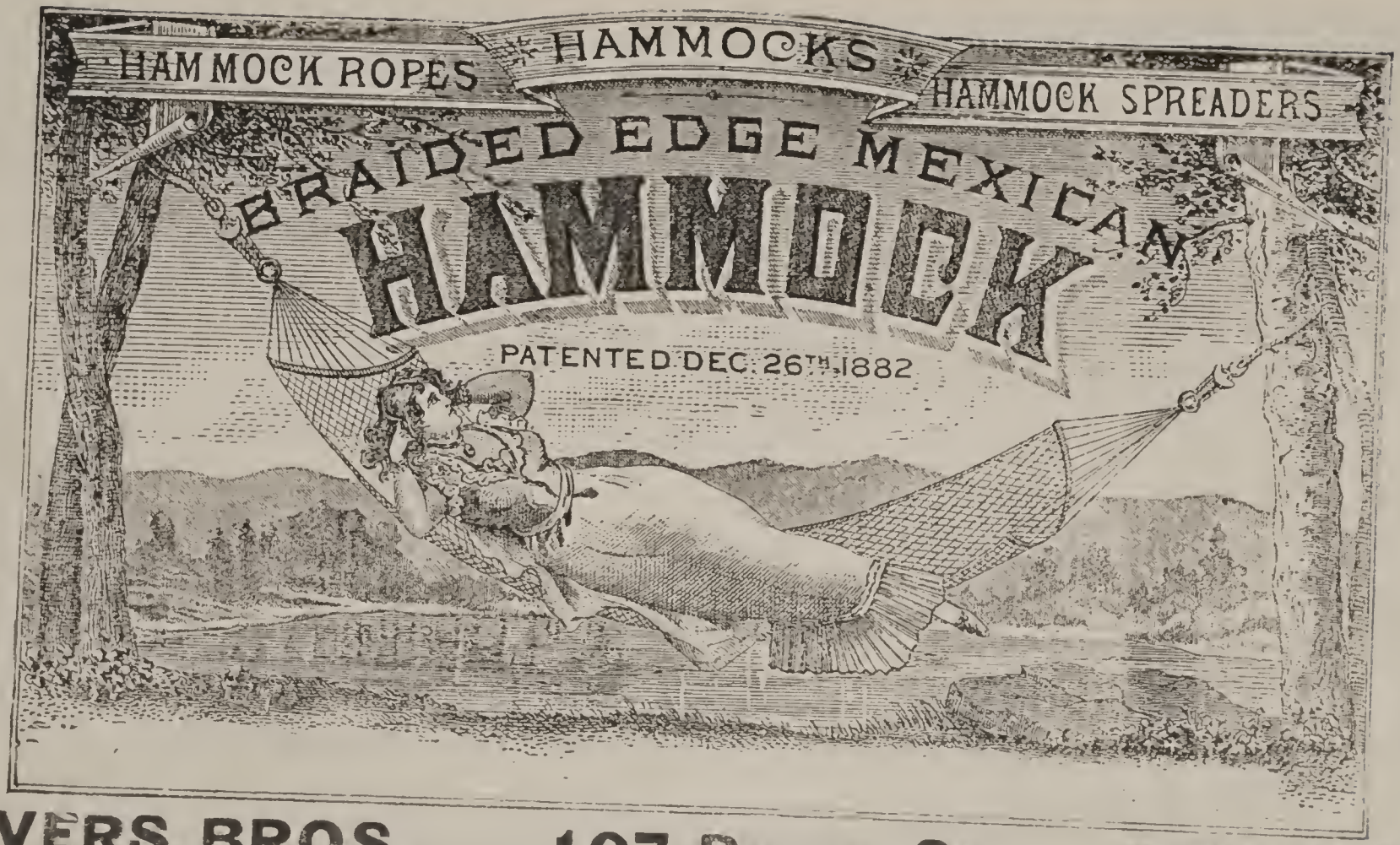
SHOWING AVERAGE WEIGHT PER FATHOM, ADMIRALTY TEST, AND SIZES OF CHAINS REQUIRED FOR VESSELS, ACCORDING TO THEIR REGISTERED TONNAGE. FOR LOW DECK VESSELS ADD ONE FIFTH TO THE TONNAGE.

Size.	Common Coil Weight in 100 feet.	Proved. Av'g Weight per Fathom.		Size of Rope.	Proof.		Ship's Tonnage.	Size of Anchor.
Inches.		Stud.	Short Link.	Inches.	Cable Chain.	B B B Crane Chain.		
3-16	50		4	1				
¼	80		6	1¾	1	1½		
5 16	100		7	2½	1½	2		
⅜	140		9	3¼	2	3		
7-16	210		12	4	3	4		
½	265		15	4¾	4	5	30	150
9-16	320		19	5½	5	6	50	200
⅝	420		25	6¼	6	8	75	300
11-16	500		3	7	8	10	100	400
¾	590	33	35	7¾	10	12	100	500
13-16	680	38	40	8½	12	14	110	600
⅞	790	43	46	9¼	14	16	130	700
15-16		50	54	10	16	18	160	800
1		58	61	10¾	18	22	200	900
1 1-16		65	69	11¼	20	26	240	1,100
1⅛		72	76	12	23	28	280	1,300
1 3-16		80	85	12¾	26	30	320	1,450
1¼		89	95	13½	28	34	360	1,600
1 5-16		98	104	14¼	30	37	400	1,750
1⅜		110	115	15	34	41	440	1,900
1 7 16		118	125	15½	37	44	500	2,100
1½		128	135	16	41	48	550	2,300
1 9-16		138	148	16½	44	52	600	2,500
1⅝		150	160	17¼	48	66	700	2,700
1 11-16		161		18	52		850	2,900
1¾		175		18½	56		1,000	3,100
1 13 16		188		19¼	60		1,150	3,300
1⅞		200		20	64		1,300	3,500
1 15-16		215		21	68		1,450	3,700
2		230		22	72		1,600	3,900
2⅛		250			80		2,000	4,300
2¼		290			88		2,500	4,700

⅜ inch and smaller chains are made of full size iron; all other sizes exact. Tested to the English Admiralty Standard.

German Coil Chain.

Wire Gauge.....	5	6	7	8	9	10	11	12	13
Number.....	000	00	0	1	2	3	4	5	6
Weight in lbs. of 100 feet...	37	30½	24	19	14¾	11¼	8¾	7	4½
Breaking Strength.....	695	580	520	488	360	322			



TRAVERS BROS., 107 Duane St., NEW YORK.

THE BRAIDED EDGE HAMMOCKS

Are made from the same fibre and woven in the same manner as the Mexican Hammocks. In place of the knotted edge, we use a BRAIDED edge which adds beauty and strength to the Hammock. Our method of putting on the ends prevents slipping. Every Hammock is carefully adjusted, so that each cord will take a portion of the strain, thus making them capable of sustaining a very heavy weight. Our colors will embrace all the new and fashionable shades. In fact the workmanship and general character of our Hammocks are in every way superior to the imported. We make the same style in Cotton, Linen, and Hemp.

SAMPLE ORDERS SOLICITED.

Approximate Weight and Strength of Cordage.

Circumfer'ce in inches.	Diameter in inches.	Weight of 100 Fat'ms, or 600 ft. in lbs.	Weight of 100 Fat'ms, Hawser Laid in lbs.	Weight of 100 Fat'ms, Tarr'd, in lbs.	Strength of New Ropes, in lbs.	No. of Feet in 1 lb.
6 thd.		14	12	17	450	43.
9 "		20	17	24	750	33.
12 "		28	23	34	900	21.
15 "		34	28	41	1250	17.
18 "		45	38	56	1700	13.
1¾		61	51	76	2250	10.
2		80	67	100	3000	7.6 in.
2¼		101	84	126	3900	6.
2½		125	104	156	4700	5.
2¾		151	126	189	5600	4.
3	1	180	150	225	6750	3.4 in.
3¼	1 1/16	211	176	264	7850	2.9 "
3½	1⅛	245	203	306	9150	2.4 "
3¾	1¼	281	234	351	10600	2.1 "
4	1 5/16	325	271	400	11950	1.10 "
4¼	1⅜	361	300	451	13450	1.7 "
4½	1½	405	338	506	15150	1.5 "
4¾	1 9/16	451	376	564	16700	1.4 "
5	1⅝	500	417	625	18700	1.2 "
5½	1¾	605	504	756	22600	1.
6	2	720	600	900	26900	.10 in
6½	2⅛	845	704	1056	31500	.8½ "
7	2¼	980	817	1225	36600	.7½ "
7½	2⅜	1125	938	1406	42000	.6¼ "
8	2⅝	1280	1067	1600	47800	.5½ "
8½	2¾	1445	1204	1806	54000	.5 "
9	3	1620	1350	2025	60500	.4½ "
9½	3⅛	1805	1504	2256	67300	.4 "
10	3⅜	2000	1667	2500	74000	.3½ "

The relative Strength of Manila to Sisal is about as 7 is to 5.

To Obtain the Weight of Grindstones.

Rule: Square the diameter (in inches), multiply by thickness (in inches), then multiply by decimal .06363.

Example: Find the weight of a stone 4 feet 6 inches diameter and 7 inches thick.

4 ft. 6 in.=54 inches; square of 54=2916; multiplied by 7 =20412; multiplied by .06363=*Ans.*, 1928.815 lbs., which is weight of stone.

CUT NAILS,

SPIKES,

CLINCH NAILS.

Boiler and Bridge Rivets.

BOILER BRACE JAWS.

SQUARE AND HEXAGON

NUTS.

Washers & Bolts.

FULLER BROTHERS & CO.,

139 Greenwich Street,

NEW YORK.

Schedule of Extras on Cut Nails.

10d to 60d Common	at Standard or Lowest Price
8d and 9d "	.25 per keg above 10d
6d and 7d "	.50 " " "
4d and 5d "	.75 " " "
3d "	1.50 " " "
3d Fine, 2d and Roofing	2.25 " " "
2d Fine	4.00 " " "
Cut Spikes, all sizes	.25 " " "
Fencing and Sheathing	Same price as same size Common Nails.

	3d	4d&5d	6d	8d	10d and larger.
Coopers', Slating and Tobacco	2.00	1.25	1.00	.75	.50 per keg above 10d common
Casing, Flooring and Box		1.50	1.25	1.00	.75 " " " "
Finishing		1.75	1.50	1.25	1.00 " " " "
Trunk		1.75			

	2 & 2¼ in.	2½ & 2¾	3 in. & longer.
Clinch	2.00	1.75	1.50 per keg above 10d common
" in half kegs	2.50	2.25	2.00 per 100 lbs. " " "

Number of Nails and Tacks in a Pound.

Nails.				Tacks.		
Title.	Length.	No. in a lb.		Title.	Length.	No. per lb.
3 penny fine	1⅛ inch	760	nails	1 ounce	3-16 inch	16,000
3 " common	1¼ "	480	"	1½ "	7-32 "	10,666
4 " "	1½ "	300	"	2 "	¼ "	8,000
5 " "	1¾ "	200	"	2½ "	5-16 "	6,400
6 " "	2 "	160	"	3 "	⅜ "	5,332
7 " "	2¼ "	128	"	4 "	7-16 "	4,000
8 " "	2½ "	93	"	6 "	8-16 "	2,666
9 " "	2¾ "	72	"	8 "	9-16 "	2,000
10 " "	3 "	60	"	10 "	10-16 "	1,600
12 " "	3¼ "	44	"	12 "	11-16 "	1,332
16 " "	3½ "	32	"	14 "	12-16 "	1,143
20 " "	4 "	24	"	16 "	13-16 "	1,000
30 " "	4½ "	18	"	18 "	14-16 "	888
40 " "	5 "	14	"	20 "	15-16 "	800
50 " "	5½ "	12	"	22 "	1 "	727
60 " "	6 "	10	"	24 "	1⅛ "	666
6 fence	2 "	80	"			
8 " "	2½ "	50	"			
10 " "	3 "	34	"			
12 " "	3¼ "	29	"			

No. of Cut Spikes in Keg of 100 Pounds.

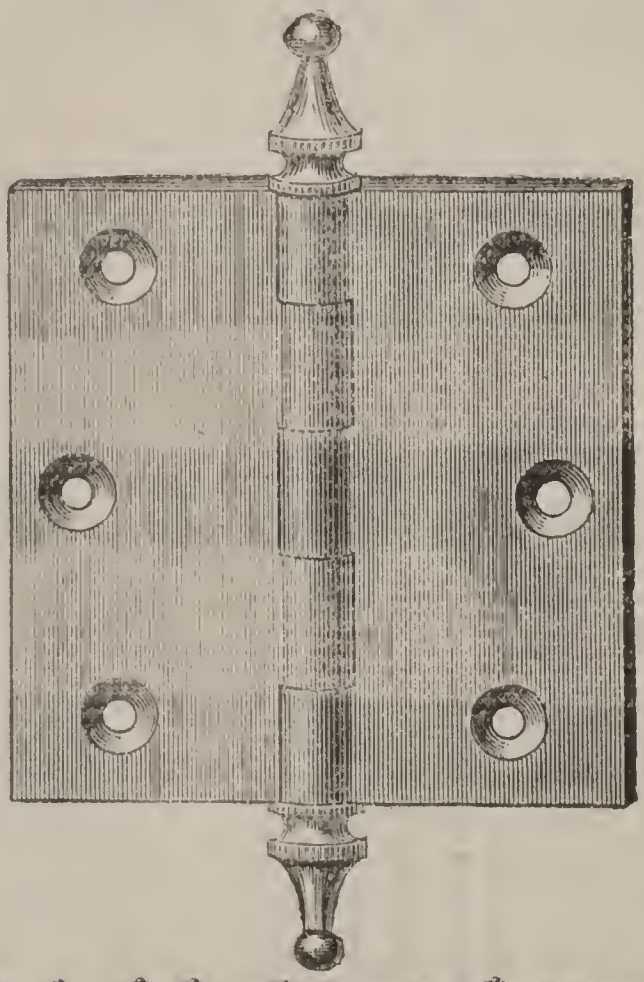
3 inch.....2,900	5 inch..... 950	6½ inches..... 575
3½ " 2,100	5½ " 850	7 " 450
4 " 1,500	6 " 775	8 " 375
4½ " 1,150		

W. & J. TIEBOUT,

— MANUFACTURERS OF —

HARDWARE,

For SHIP and HOUSE BUILDING.



Nos. 16 & 18 Chambers Street,

NEW YORK,

Manufacture and keep in stock a great variety of

CAST BRASS HARDWARE,

Galvanized Iron Hardware,

GALVANIZED NAILS, SPIKES, &c.

Ship Chandlery Hardware.

Weight of Tire Iron,

PER SET OF 54 FEET.

Size.	Lbs.	Size.	Lbs.	Size.	Lbs.
1 by 3-16	34	1 1-4 by 1-4	56	1 1-2 by 5-8	169
1 by 1-4	45	1 1-4 by 5-16	70	1 5-8 by 1-2	148
1 by 5-16	56	1 1-4 by 3-8	85	1 5-8 by 5-8	1[illegible]3
1 by 3-8	68	1 1-4 by 7-16	99	1 3-4 by 1-2	148
1 1-8 by 1-4	50	1 1-4 by 1-2	113	1 3-4 by 5-8	197
1 1-8 by 5-16	63	1 3-8 by 3-8	93	1 3-4 by 3-4	136
1 1-8 by 3-8	75	1 3-8 by 1-2	124	2 by 1-2	180
1 1-8 by 7-16	88	1 1-2 by 3-8	101	2 by 5-8	125
1 1-8 by 1-2	101	1 1-2 by 1-2	135	2 by 3-4	170

Railroad Spikes.

NUMBER IN 100 POUNDS.

Thickness	Length.									
	3	4	5	6	7	8	9	10	12	14
1-4	1340	1060	870	680						
5-16		620	580	540						
3-8			460	380	320	290	250			
7-16			320	280	240	220	200			
1-2			260	210	180	170	140	130	110	
5-8			170	130			100	90	80	70

Wrought Boat and Ship Spikes.

NUMBER IN A KEG OF 150 POUNDS.

Thickness	Length.														
	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10
1-4	1910	1585	1326	1223	1025										
5-16	1010	963	810	605	583		521								
7-16			542	503	461	423	402	321							
1-2					340	312	298	280	261	240	223				
9-16							221	200	190	180	170	160	150	140	130
5-8											140	130	120	110	100

BROWNING, SISUM & CO.,

No. 85 CHAMBERS ST., N. Y.,

MANUFACTURE

Hardware Specialties,

COTTER'S SPRING KEYS,

— AND —

MANUFACTURERS' SUPPLIES.

D Rings,

Belt Hooks,

STAPLES, &c.

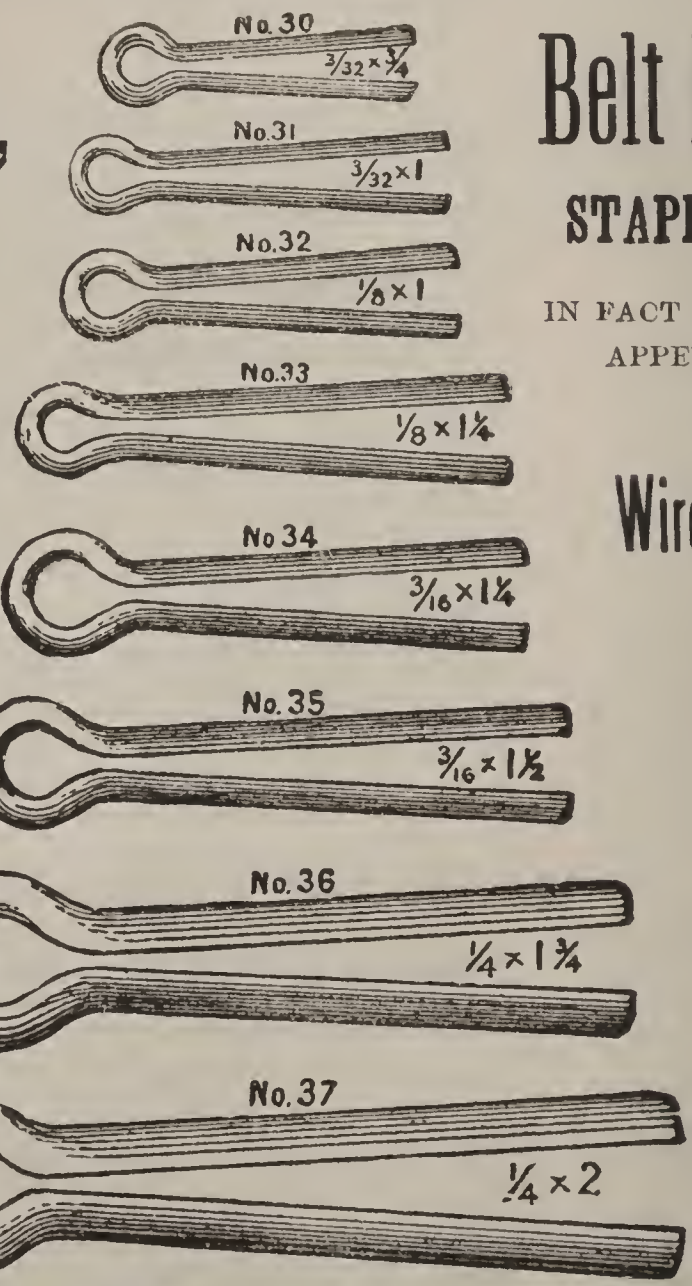
IN FACT EVERYTHING APPERTAINING TO

Wire Bending.

FACTORY:

BROOKLYN,

N. Y.



OUR GOODS ARE MADE OF THE BEST STOCK ONLY,

Properly Tempered and Fully Warranted.

Spring Cotters and Keys and their Applications.

SPRING COTTERS.

No	30	31	32	33	34	35	36	37	39	39
Wire Gauge..	13	13	11	11	7	7	4	4	1	1
For Hole.....	3/32	3/32	1/8	1/8	3/16	3/16	1/4	1/4	5/16	5/16
For Nuts.....	1/2	3/4	3/4	7/8	7/8	1	1	1 1/4	1 1/4	1 1/2

SPRING KEYS.

No	000	00	0	1	1½	2	3	4
Wire Gauge.....	12	12	12	11	11	10	10	10
For Hole.....	7/32	7/32	7/32	1/4	1/4	9/32	9/32	9/32
For Bolts.....	5/8	3/4	7/8	5/8	7/8	5/8	7/8	1

Machine Bolts with Square Heads and Nuts.

Weight of 100, in Pounds.

Length, Inches.	Thickness of Bolt in Inches.							
	¼	5-16	⅜	7-16	½	⅝	¾	⅞
1½	4.16	7.59	10 62	15.94	23.87	39.31		
¾	4 22	7.87	11.72	16.90	25 06	41 38		
2	4.75	8.56	12.38	18 25	26.44	45.69	73.62	
¼	5.34	9 12	12.90	19.38	28.62	49.50	76.	
½	5.97	9.59	14.69	20.69	29.50	51.25	79.75	
¾	6.50	10.44	16.47	21.50	31.16	53.	83	
3		10.78	17.87	22.38	32.44	56.	85.38	127.25
½		11.81	18.94	26.19	39.75	63.12	93.44	140.56
4			20.69	28 87	42.50	74.87	108.12	148 37
½			21.69	29 87	44.87	79.62	113.12	158.76
5			23.62	32.31	48.81	83.	122.	167.25
½			25 81	34 44	51.38	87 88	128.62	174.88
6			26.87	36.62	53.31	92.38	131.75	204 25
½					56 87	96.88	139.56	214.69
7					59 12	99.87	145 50	228.44
½					61.87	105 75	150.88	235.31
8					64.44	109 50	157.12	248.88
9					70.50	118.12	169.92	258.12
10	. ..				77.	128.13	184.	276.18
11					82.88	136.19	195 13	295.69
12					86.37	144.87	209.75	311.94
13					92.	155.62	219.37	335.81
14					97 75	163.58	337.50	351.88
15					103.25	170.75	349.05	391.35

— THE —

Union Nut Company,

99 Chambers Street,

A. S. UPSON, Pres't.
S. FRISBIE, Sec. & Treas.

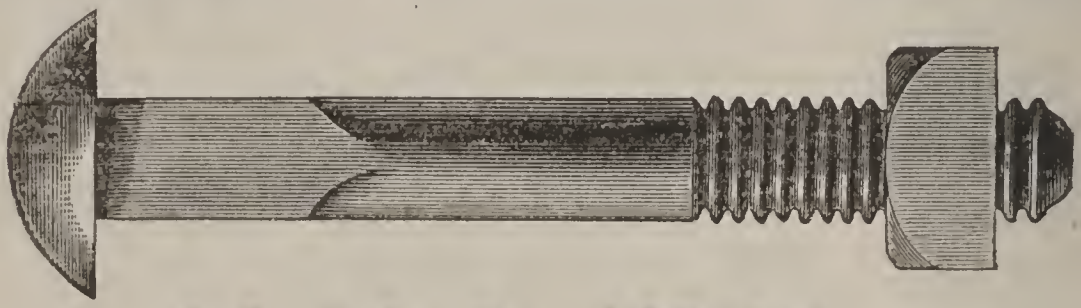
NEW YORK,

T. SMITH, Ass't Sec.
J. L. VARICK, Ass't Treas.

MANUFACTURERS OF

NUTS AND WASHERS,

CARRIAGE, TIRE, PLOW, STOVE, AGRICULTURAL & MACHINE



BOLTS.

Bolt Ends, Turn Buckles, Lag and Skein Screws.

Carriage Hardware,

Rules, Plumbs and Levels, Try Squares and T Bevels,

MANUFACTORIES,

UNIONVILLE, Conn., & CLEVELAND, Ohio.

AGENTS FOR

The Upson Nut Co.
Cleveland Nut Co.
Hotchkiss & Upson Co.
Meech & Hart Co.
Standard Rule Co.
Athol Machine Co.
Bailey Wringing Machine Co.

A. C. HOOKE, Traveling Salesman.

TABLE

SHOWING THE AVERAGE NUMBER OF COLD PRESSED NUTS IN A KEG, 150 LBS EACH, SQUARE AND HEXAGON, OF STANDARD SIZES,

As adopted by "The Association of Bolt and Nut Manufacturers of the U. S."

Width.	Thickness	Hole.	Bolt.	No. of Square.	No. of Hexagon.
11-32	5-32	3-32	1-8	45,000	
13-32	3-16	5-32	3-16	22,500	
1-2	1-4	7-32	1-4	10,000	10,500
5-8	5-16	9-32	5-16	5,106	6,666
3-4	3-8	11-32	3-8	2,727	4,528
7-8	7-16	13-32	7-16	1,904	2,057
7-8	1-2	7-16	1-2	1,695	1,890
1	1-2	7-16	1-2	1,218	1,538
1 1-8	1-2	1-2	4-16	1,016	1,245
1 1-8	5-8	9-16	5-8	835	957
1 1-4	5-8	9-16	5-8	639	740
1 3-8	3-4	21-32	3-4	450	555
1 1-2	3-4	21-32	3-4	368	430
1 5-8	7-8	25-32	7-8	260	270
1 3-4	7-8	25-32	7-8	243	252
1 3-4	1	7-8	1	249	257
2	1	7-8	1	163	204
2	1 1-8	15-16	1 1-8	143	168
2 1-4	1 1-8	15-16	1 1-8	109	150
2 1-4	1 3-8	1 1-16	1 3-8	85	120
2 1-2	1 1-4	1 1-16	1 1-4	84	93
2 3-4	1 3-8	1 3-16	1 3-8	55	60
3	1 1-2	1 5-16	1 1-2	51	56
3 1-4	1 5-8	1 7-16	1 5-8	39	44
3 1-2	1 3-4	1 9-16	1 3-4	32	35
3 3-4	1 7-8	1 11-16	1 7-8	28	30
4	2	1 13-16	2	20	22

List of Threads for Bolts and Nuts.

Right Hand Threads.		Left Hand Threads.
Size. No. Threads.	Size. No. Threads.	Size. No. Threads.
3-16.....20	7-8.....9, 10	1-4 18
1-4 18, 16, 20	1 8, 10	5-16.....16
5-16.....16, 18, 20	1 1-8.....8	3-8 14
3-8 14, 16	1 1-4.....7	7-16.....14
7-16.....14, 16, 12	1 3-8.....7	1-2 12
1-2 12, 14, 10	1 1-2.....7	5-8 10
9-16.....12	1 5-8.....5 1-2	3-4 10
5-8 10, 11, 12	1 3-4.....5	7-8 9
3-4 10, 9, 12	2 4 1-2	1 8

The first column of the number of threads to the inch are the standard threads.

— THE —

Livingston Horse Nail Co.'s

104 Reade Street,

NEW YORK.

ALL BRANDS

—OF—

Horse Nails



BURDEN'S

Horse and Mule

SHOES.

AGENTS FOR

HELLER & BROTHERS

HORSE RASPS AND FILES.

AGENTS FOR

C. F. DEWICK & CO.'S

Steel Toe Calks.

TABLE

SHOWING THE AVERAGE NUMBER OF WASHERS IN A KEG OF 150 LBS., OF EACH STANDARD SIZE,

As Adopted by "The Association of Bolt and Nut Manufacturers of the U. S."

Diameter.	Size of Hole	Thickness Wire Gauge.	Size of Bolt	No. in 150 lbs
1-2	1-4	No. 18	3-16	80.000
5-8	5-16	" 16	1-4	34.285
3-4	5-16	" 16	1-4	22.000
7-8	3-8	" 16	5-16	18.500
1	7-16	" 14	3-8	10.550
1 1-4	1-2	" 14	7-16	7.500
1 3-8	9-16	" 12	1-2	4.500
1 1-2	5-8	" 12	9-16	3.850
1 3-4	11-16	" 10	5-8	2.500
2	13-16	" 10	3-4	1.600
2 1-4	15-16	" 9	7-8	1.300
2 1-2	1 1-16	" 9	1	950
2 3-4	1 1-4	" 9	1 1-8	700
3	1 3-8	" 9	1 1-4	550
3 1-2	1 1-2	" 9	1 3-8	450

PERKINS HORSE SHOES.

Weight expressed in ounces.

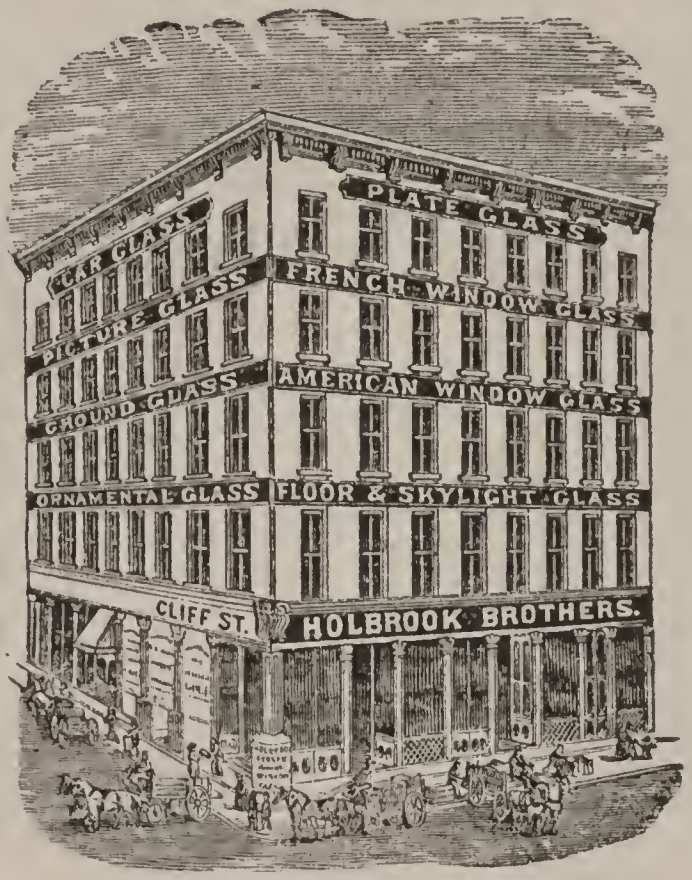
Front Shoes, No.	0	1	2	3	4	5	6	7	8
Light	13	15	17	21	24	29	35		
Medium		17	20	24	28	34	38		
Heavy		19	22	27	32	36	41	49	54
Hind Shoes, No.	0	1	2	3	4	5	6	7	8
Light	10	12	15	18	22	26	31		
Medium		14	16	20	24	28	33		
Heavy		14	17	21	25	30	34	38	43
Mule, No.	1	2	3	4	5	6	7		
Front Shoes	10	12	15	18	22	25	29		

"Ausable" Horse Shoe Nails.

STANDARD SIZES.

No.	4	5	6	7	8	9	10	12
Length in inches.	$1\frac{5}{8}$	$1\frac{15}{16}$	$2\frac{1}{32}$	$2\frac{1}{4}$	$2\frac{7}{16}$	$2\frac{9}{16}$	$2\frac{11}{16}$	$3\frac{1}{16}$
Number in pound	276	168	138	110	96	80	73	57

WINDOW GLASS.



— IMPORTERS —

ENGLISH and FRENCH PLATE GLASS.
FRENCH WINDOW GLASS.
FRENCH PICTURE GLASS.
FRENCH CAR GLASS.
ENAMELED GLASS.
GROUND GLASS.
CATHEDRAL GLASS.
RUBY, BLUE, GREEN, ORANGE and PURPLE GLASS.

SHARRATT & NEWTH'S ENGLISH GLAZIERS' DIAMONDS.

— ALSO —

American Plate Glass. *American Window Glass.*
Floor and Skylight Glass. *Embossed and Cut Glass.*

All kinds of Glass Cut to any Size and Shape required. Estimates furnished.

HOLBROOK BROTHERS,

87 and 89 Beekman, and 53 and 55 Cliff Streets,

NEW YORK CITY.

WINDOW GLASS.

FRENCH OR AMERICAN.

No. of Lights per Box of 50 Feet.

6	by	8	150	13	by	20	28	16	by	54	8	24	by	30	10	32by	36	6
6½	"	8½	130	13	"	22	25	16	"	60	8	24	"	32	10	32	" 38	6
7	"	9	115	13	"	24	23	18	"	20	20	24	"	34	9	32	" 40	6
8	"	10	90	13	"	26	21	18	"	20	18	24	"	36	9	32	" 42	6
8½	"	10½	81	13	"	28	20	18	"	24	17	24	"	38	8	32	" 44	5
8	"	11	82	13	"	30	19	18	"	26	16	24	"	40	8	32	" 48	5
8	"	12	75	13	"	32	17	18	"	28	14	24	"	42	7	32	" 50	5
9	"	11	73	14	"	15	34	18	"	30	14	24	"	46	7	32	" 56	4
9	"	12	67	14	"	16	32	18	"	32	13	24	"	48	6	32	" 60	4
9	"	13	62	14	"	17	31	18	"	34	12	24	"	50	6	32	" 66	3
9	"	14	57	14	"	18	29	18	"	36	11	24	"	54	6	34	" 36	6
9	"	15	53	14	"	20	26	18	"	38	11	24	"	56	5	34	" 40	6
9	"	16	50	14	"	22	24	18	"	40	10	24	"	60	5	34	" 44	5
9	"	18	45	14	"	24	22	18	"	42	10	24	"	66	5	34	" 46	5
10	"	12	60	14	"	26	20	18	"	44	9	26	"	28	10	34	" 48	5
10	"	13	55	14	"	28	19	18	"	46	9	26	"	30	9	34	" 50	4
10	"	14	52	14	"	30	17	18	"	50	8	26	"	32	9	34	" 54	4
10	"	15	48	14	"	32	16	18	"	52	8	26	"	34	8	34	" 56	4
10	"	16	45	14	"	34	15	18	"	56	7	26	"	36	8	34	" 60	4
10	"	17	43	14	"	36	14	18	"	60	7	26	"	38	7	34	" 66	3
10	"	18	40	14	"	38	14	20	"	22	16	26	"	42	7	36	" 40	5
10	"	20	36	14	"	40	13	20	"	24	15	26	"	44	6	36	" 44	5
10	"	22	33	14	"	42	12	20	"	26	14	26	"	48	6	36	" 46	4
10	"	24	30	14	"	44	12	20	"	28	13	26	"	50	6	36	" 48	4
10	"	26	28	14	"	46	11	20	"	30	12	26	"	52	5	36	" 50	4
10	"	28	26	15	"	16	30	20	"	32	11	26	"	54	5	36	" 54	4
10	"	30	24	15	"	18	27	20	"	34	11	26	"	58	5	36	" 56	4
11	"	12	55	15	"	20	24	20	"	36	10	26	"	60	5	36	" 60	3
11	"	13	51	15	"	22	22	20	"	38	10	28	"	30	9	36	" 64	3
11	"	14	47	15	"	24	20	20	"	40	9	28	"	32	8	36	" 66	3
11	"	15	44	15	"	26	19	20	"	42	9	28	"	34	8	36	" 70	3
11	"	16	41	15	"	28	17	20	"	44	8	28	"	36	7	38	" 40	5
11	"	17	39	15	"	30	16	20	"	48	8	28	"	40	7	38	" 42	5
11	"	18	37	15	"	32	15	20	"	50	7	28	"	42	6	38	" 44	4
11	"	20	33	15	"	34	14	20	"	54	7	28	"	46	6	38	" 52	4
11	"	22	30	15	"	36	13	20	"	58	6	28	"	50	5	38	" 56	3
11	"	24	27	15	"	38	13	20	"	64	6	28	"	56	5	38	" 62	3
12	"	13	46	15	"	40	12	22	"	24	14	28	"	60	4	38	" 66	3
12	"	14	43	16	"	16	28	22	"	26	13	28	"	66	4	40	" 40	4
12	"	15	40	16	"	18	25	22	"	28	12	30	"	30	8	40	" 42	4
12	"	16	38	16	"	20	23	22	"	30	11	30	"	32	8	40	" 44	4
12	"	17	35	16	"	22	21	22	"	32	10	30	"	34	7	40	" 50	4
12	"	18	34	16	"	24	19	22	"	34	10	30	"	38	7	40	" 54	3
12	"	20	30	16	"	26	17	22	"	36	9	30	"	40	6	40	" 60	3
12	"	22	27	16	"	28	16	22	"	38	9	30	"	44	6	40	" 66	3
12	"	24	25	16	"	30	15	22	"	40	8	30	"	46	5	40	" 72	3
12	"	26	23	16	"	32	14	22	"	42	8	30	"	48	5	42	" 42	4
12	"	28	22	16	"	34	13	22	"	44	7	30	"	50	5	42	" 48	4
12	"	30	20	16	"	36	13	22	"	48	7	30	"	52	5	42	" 52	3
12	"	32	19	16	"	38	12	22	"	50	7	30	"	54	4	42	" 62	3
12	"	34	18	16	"	40	11	22	"	52	6	30	"	56	4	42	" 68	3
12	"	36	17	16	"	42	11	22	"	56	6	30	"	60	4	44	" 46	4
13	"	14	40	16	"	44	10	22	"	60	5	30	"	64	4	44	" 50	3
13	"	15	37	16	"	46	10	24	"	24	12	30	"	66	4	44	" 56	3
13	"	16	35	16	"	48	9	24	"	26	12	30	"	70	3	46	" 54	3
13	"	18	31	16	"	52	9	24	"	28	11	32	"	34	7	46	" 64	3

COX, PARISH & UNGER,

28 COLLEGE PLACE,

NEW YORK.

LAMPS,

GLASSWARE

— AND —

OIL FIXTURES.

Solid Eye Sash Weights.

LENGTH AND THICKNESS OF EACH SIZE.

Weight.	Inches in Diam.	Length.	Weight.	Inches in Diam.	Length.	Weight.	Inches in Diam.	Length
2	1½	5¾	9	1⅝	18½	18	2	23¾
2½	1½	6⅝	9½	1⅝	18¾	19	2	24⅞
3	1½	7¾	10	1¾	18	20	2	25⅜
3½	1½	9¼	10½	1¾	18¼	21	2	27⅛
4	1½	10¾	11	1¾	19¼	22	2	27¾
4½	1½	11¾	11½	1¾	20⅛	23	2	29¾
5	1½	12½	12	1⅞	18½	24	2	31¼
5½	1½	13½	12½	1⅞	19⅝	25	2	32¼
6	1½	14¾	13	2	17⅝	26	2	32⅞
6½	1½	16⅜	14	2	19⅜	27	2	34½
7	1½	17	15	2	20½	28	2	36¾
7½	1½	18¼	16	2	21⅝	29	2	38¼
8	1⅝	16⅜	17	2	22½	30	2	39½
8½	1⅝	17½						

Measuring Building Materials.

The following figures are worth remembering, as they will save a good deal of calculation and give approximately accurate results with a minimum of labor:

A cord of stone, three bushels of lime and a cubic yard of sand will lay 100 cubic feet of wall.

Five courses of brick will lay 1 foot in height on a chimney.

Nine bricks in a course will make a flue 8 inches wide and 20 inches long, and 8 bricks in a course will make a flue 8 inches wide and 16 inches long.

Eight bushels of good lime, 16 bushels of sand and one bushel of hair will make enough mortar to plaster 100 square yards.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching of the floor

One thousand laths will cover 70 yards of surface, and 11 pounds of nails will nail them on.

One thousand shingles laid 4 inches to the weather will cover 100 square feet of surface, and five pounds of shingle nails will fasten them on.

Comparative Values of Woods for Fuel.

Taking shellbark hickory as the highest standard, and calling that 100, other trees will compare with it for burning purposes, as follows: Shellbark hickory, 100; pignut hickory, 95; white oak, 84; white ash, 77; dogwood, 75; scrub oak, 73; white hazel, 72; apple tree, 70; white beech, 69; black birch, 65; hard maple, 65; black walnut, 62; yellow oak, 60; white elm, 58; red oak, 56; red cedar, 56; wild cherry, 55; yellow pine, 54; chestnut, 52; yellow poplar, 51; butternut, 43; white birch, 43; white pine, 30.

Strength of Ice.

Ice two inches thick will bear men on foot; four inches, men on horseback; six inches thick will bear cattle and teams with light loads; eight inches tack, teams with heavy loads. Ten inches will sustain a pressure of 1,000 pounds per square foot. The above is on the supposition that the ice is sound, and not "snow-ice."

BRIDGEPORT BRASS CO.,

—MANUFACTURERS OF—

ROLL & SHEET BRASS,

BRASS & COPPER WIRE,

COPPER & BRASS SEAMLESS TUBING.

COPPER RIVETS & BURRS,

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IRON AND TINNED RIVETS,

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BRASS & COPPER TUBING,

BRASS BUTT HINGES,

BRASS & IRON JACK CHAIN,

Kerosene Oil Burners & Trimmings.

FOWLER & LAMBETH'S PATENT FLY FANS.

The Celebrated **LEADER BURNERS** Our Specialty.

&c., &c., &c.,

No. 19 MURRAY STREET,

NEW YORK.

Weight of Iron, Steel, Copper and Brass Plates.

DIAMETER AND THICKNESS DETERMINED BY AMERICAN GAUGE.

No. of Gauge.	Size of each No.	Weight of Plates per Square Foot.			
		Wrought Iron.	Steel.	Copper.	Brass.
	Inch.	Lbs.	Lbs.	Lbs.	Lbs.
0000	.46000	17.25	17.48	20.838	19.688
000	.40964	15.3615	15.5663	18.557	17.533
00	.36480	13.68	13.8624	16.525	15.613
0	.32486	12.1823	12.3447	14.716	13.904
1	.28930	10.8488	10.9934	13.105	12.382
2	.25763	9.6611	9.7899	11.671	11.027
3	22942	8.6033	8.7180	10.393	9.8192
4	.20431	7.6616	7.7638	9.2552	8.7445
5	.18194	6.8228	6.9137	8.2419	7.787
6	.16202	6.0758	6.1568	7.3395	6.9345
7	.14428	5.4105	5.4826	6.5359	6.1752
8	.12849	4.8184	4 8826	5.8206	5.4994
9	.11443	4.2911	4.3483	5.1837	4.8976
10	.10189	3.8209	3.8718	4.6156	4.3609
11	.090742	3.4028	3.4482	4.1106	3.8838
12	.080808	3 0303	3.0707	3.6606	3.4586
13	.071961	2.6985	2.7345	3.2598	3.0799
14	.064084	2.4032	2.4352	2.9030	2.7428
15	.057068	2.1401	2.1686	2.5852	2.4425
16	.050820	1.9058	1.9312	2.3021	2.1751
17	.045257	1.6971	1.7198	2.0501	1.937
18	.040303	1.5114	1.5315	1.8257	1.725
19	.035890	1.3459	1.3638	1.6258	1.5361
20	.031961	1.1985	1.2145	1.4478	1.3679
21	.028462	1.0673	1.0816	1.2893	1.2182
22	.025347	.95051	.96319	1.1482	1.0849
23	.022571	.84641	.8577	1.0225	.96604
24	.020100	.75375	.7638	.91053	.86028
25	.017900	.67125	.6802	.81087	.76612
26	.01594	.59775	.60572	.72208	.68223
27	.014195	.53231	.53941	.64303	.60755
28	.012641	.47404	.48036	.57264	.54103
29	.011257	.42214	.42777	.50994	.48180
30	.010025	.37594	.38095	.45413	.42907
31	.008928	.3348	.33926	.40444	.38212
32	.007950	.29813	.3021	.36014	.34026
33	.007080	.2655	.26904	.32072	.30302
34	.006304	.2364	23955	.28557	.26981
35	.005614	.21053	.21333	.25431	.24028
36	.005000	.1875	.19	.2265	.2140
37	.004453	.16699	.16921	.20172	.19059
38	.003965	.14869	.15067	.17961	.1697
39	.003531	.13241	13418	.15995	.15113
40	.003144	.1179	.11947	.14242	.13456
Specific Grav.....		7.200	7.293	8.693	8.218
Weight per Cubic Foot..		450.	456.	543.6	513.6

Stanley Rule and Level Co.

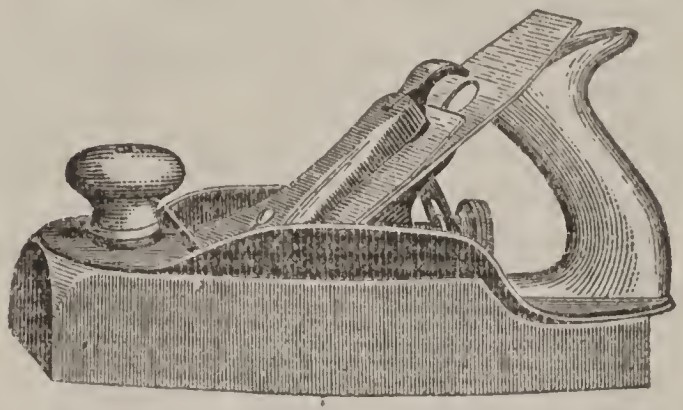
MANUFACTURERS OF

BOXWOOD AND IVORY RULES,

Plumbs and Levels, Try Squares, Bevels, Gauges, Mallets, Screw Drivers, Etc.

ALSO,

BAILEY'S PATENT ADJUSTABLE PLANES



AND OTHER IMPROVED CARPENTER'S TOOLS.

Factories, NEW BRITAIN, Conn.

Warerooms, No. 29 Chambers Street, New York.

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G. W. Bradley's

Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,
Ring Bush Hooks,
Ax Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

MARTEN DOSCHER, Agent,

85 Chambers Street, N. Y.

Bar and Sheet Brass.

WEIGHT IN POUNDS.

Thickness, or Diameter, or Size; Inches.	Sheets per Square Foot.	Square Bars 1 Foot Long.	Round Bars 1 Foot Long.	Thickness, or Diameter, or Size; Inches.	Sheets per Square Foot.	Square Bars 1 Foot Long.	Round Bars 1 Foot Long.
1-16	2.7	.015	.011	1 1-16	45.95	4.07	3.20
⅛	5.41	.055	.045	⅛	49.69	4.55	3.57
3-16	8.12	.123	.1	3-16	51.4	5.08	3.97
¼	10.76	.225	.175	¼	54.18	5.65	4.41
5-16	13.47	.350	.275	5-16	56.85	6.22	4.85
⅜	16.25	.51	.395	⅜	59.55	6.31	5.35
7-16	19.	.69	.54	7-16	62.25	7.45	5.85
½	21.65	.905	.71	½	65.	8.13	6.37
9-16	24.3	1.15	.9	9-16	67.75	8.83	6.92
⅝	27.12	1.4	1.1	⅝	70.35	9.55	7.48
11-16	29.77	1.72	1.35	11-16	73.	10.27	8.05
¾	32.46	2.05	1.60	¾	75.85	11.	8 65
13-16	35.18	2.4	1.85	13-16	78.52	11.82	9.29
⅞	37.85	2.75	2 15	⅞	71.25	72.68	9 95
15-16	40.55	3.15	2.48	15-16	84.	13.5	10.58
1	43.29	3.65	2.85	2	86.75	14.35	11.25

Bar and Sheet Copper.

Weight in Pounds.

Thickness, or Diameter, or Size; Inches.	Sheets per Square Foot.	Square Bars 1 Foot Long.	Round Bars 1 Foot Long.	Thickness, or Diameter, or Size; Inches.	Sheets per Square Foot.	Square Bars 1 Foot Long.	Round Bars 1 Foot Long.
1-16	2.83	.015	.011	1 1-16	49.	4.35	3 41
⅛	5.75	.06	.056	⅛	52.	4.83	3 85
3-16	8.65	.134	.105	3-16	54 9	5.40	4.29
¼	11.48	.235	.187	¼	57 65	6.	4.73
5-16	14.36	.375	.295	5-16	60.5	6.60	5 20
⅜	17.23	.54	.424	⅜	53.45	7.27	5.70
7-16	20.19	.735	.575	7-16	66.35	7.90	6 28
½	23.1	.960	.75	½	69.3	8 64	6.80
9-16	26.	1.21	.95	9-16	72.15	9 28	7.30
⅝	28.85	1.51	1 17	⅝	75.1	10.15	8.
11-16	31.68	1.81	1.42	11-16	77 95	10 95	8.6
¾	34.57	2.15	1 7	¾	80.75	11 70	9.24
13-16	86.46	2.54	2.	13-16	83 60	12.60	9.85
⅞	40.39	2.95	2.3	⅞	86 58	13 46	10.55
15-16	43.27	3.37	2.64	15-16	09.45	14.35	11.25
1	46.15	3.84	3.01	2	92.25	15.35	12.

BRAZED COPPER PIPES.

WEIGHT PER RUNNING FOOT IN POUNDS.

Diam. inch.	Thickness in Inches.					
	1-16	3-16	⅛	5 16	¼	7-16
1	.8	1.2	1.7	2 7	3.8	4.9
¼	1.	1.5	2.1	3 3	4.5	6.
½	1.2	1.8	2.5	3.8	5.3	6.9
¾	1 4	2.1	2.8	4.4	6.	7.8
2	1.5	2.4	3 2	4.9	6.8	8.7
¼	1.8	2.6	3.6	5.5	7.6	9.7
½	1.9	2.9	4.	6 1	8.4	10.6
¾	2.1	3.2	4.4	6 7	9 1	11.7
3	2.3	3.5	4.7	7.3	9.9	12.5
½	2.7	4	5 5	8 4	11.4	14.4
4	3.	4.6	6.3	9.5	12.9	16.3
½	3.4	5.2	7.	10.7	14.4	18.2
5	3.8	5.7	7.8	11.8	16.	20.1
½	4.2	6.3	8.5	13.1	17.5	22.5
6	4.6	6.8	9.3	14 1	19.	23 9

Standard Sizes, Lengths, &c., of Seamless Drawn Tubing.

Inches Outside Diam.	Length Feet.	Brown & Sharpe's Gauge.	Weights per Foot.		Inches Outside Diam.	Length Feet.	Brown & Sharpe's Gauge.	Weights per Foot	
			Brass.	Copper.				Brass.	Copper.
⅝	12	16	⅜	⅜	1 15-16	12	11&10	2	2 1-10
¾	12	15	½	½	2	12	"	2 1-5	2¼
13-16	12	15	9-16	9-16	2⅛	10	"	2¼	2⅜
⅞	12	15	⅝	⅝	2¼	10	"	2⅜	2½
15-16	12	15	11-16	11-16	2⅜	10	"	2½	2⅝
1	12	4	¾	¾	2½	10	S&8½	2¾	3
1⅛	12	14	⅞	⅞	2⅝	10	"	3	3⅛
1¼	12	13	1¼	1	2¾	10	"	3⅛	3¼
1⅜	12	12½	1⅜	1⅜	3	10	"	3 1-3	3½
1½	12	12	1½	16-10	3¼	10	"	3⅞	4⅓
1⅝	12	11½	1⅝	17-10	3½	10	"	4¼	4⅜
1¾	12	11	1¾	18-10	4	10	"	5	5¼
1 13-16	12	11	1 13-16	19-10	5	10	"	7	8
1⅞	12	11&10	1⅞	1 15-16					

Weight of Brass, Copper, and Zinc Tubing, per Foot.

Numbered by Brown & Sharpe's Gauge. Weights in Thousandths of Lbs.

BRASS. No. 17.		BRASS. No. 20.		COPPER Lightning Rod Tube. No. 23.	
Inch.	Lbs	Inch.	Lbs.	Inch.	Lbs.
¼	.107	⅛	.032	½	.162
5-16	.157	3-16	.039	9-16	.176
⅜	.185	¼	.063	⅝	.186
7-16	.234	5-16	106	11-16	.211
½	.266	⅜	.126	¾	.229
9-16	.318	7-16	158		
⅝	.3?3	½	.189		
¾	.377	9-16	.208	ZINC.	
⅞	.462	⅝	.220	No. 20.	
1	.542	¾	.252		
1⅛	675	⅞	.284	¼	.161
1¼	.740	1	.378	⅝	.185
1½	.915	1¼	.500	¾	.234
1¾	.980	1½	.580	⅞	.272
2	1.90			1	.311
2½	1.506			1¼	.380
3	2 188			1½	.452

BRASS KETTLES,

WEIGHT AND CAPACITY OF.

7 in.....	1 lb.....	½ gal.		18 in.....	10½ lb.....	10½ gal.	
8 "	1½ "	1 "		19 "	12 "	12 "	
9 "	2¼ "	1½ "		20 "	14 "	14½ "	
10 "	2¾ "	2 "		21 "	16½ "	17 "	
11 "	3½ "	2½ "		22 "	19¾ "	20 "	
12 "	4¼ "	3 "		23 "	23 "	23 "	
13 "	5 "	4 "		24 "	26½ "	26 "	
14 "	5¾ "	5 "		25 "	29 "	30 "	
15 "	6¾ "	6 "		26 "	31 "	33 "	
16 "	7¾ "	7½ "		27 "	33 "	37 "	
17 "	9 "	9 "		28 "	36 "	42 "	

Number of Copper Belt Rivets and Burs in one Pound.

Inch....	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1	1⅛	1¼	1½	Burs
No. 7...	272	250	228	180	164	160	148	112	116	100	84	80	69	345
" 8...	276	248	208	200	178	172	152	136	110	104	96			390
" 9...	340	280	272	248	228	220	184	176	156	136				610
" 10..	544	448	384	340	304	300	272	238	204					716
" 12...	588	512	452	404	354	334	304	272						985
" 13...	996	852	532											1630

Copper Hose Rivets and Burs.

Size	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	Burs.
No. 7....			155	142	133	122	109	97	345
" 8....	308	201	181	160	150	135	116	100	390

Copper Oval Head (or Trunk) Rivets and Burs.

	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1	1⅛	1¼	Burs
No. 9	320	285	259	243	219	199	177	159	137	123	113	104	610

Number of Copper Braziers' Rivets in one Pound.

Nos	0	1	2	3	4	5	6	7	8	9	10
	148	100	70	44	34	24	18	12	9	6	4

PETER A. FRASSE. JOHN L. HOWE.

PETER A. FRASSE & CO.,

95 and 97 Fulton Street,

NEW YORK.

— HEADQUARTERS FOR —

STUBS' FILES, TOOLS and STEEL WIRE.

OFFICE OF N. Y. FILE WORKS.

ESTABLISHED 1816.

Agents for
Am. Screw Co.

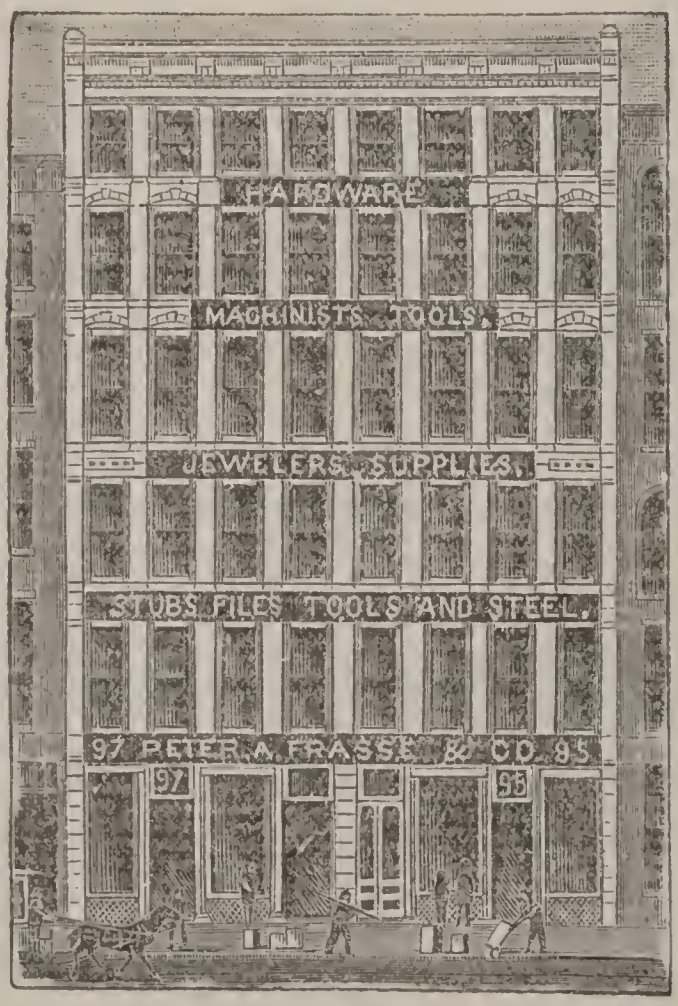
MORSE'S
Twist Drills
AND
Reamers.

GROBETS'
FINE
Finishing Files

Diesinker's
Files.

STEEL
MUSIC WIRE.

Gravers
OF ALL KINDS.



Manufacturers of
P. A. F. & Co's
Rolling Mills.

Polishing
Heads & Stands.

Stocks & Dies,
ALL MAKES.

OIL STONES.

CHUCKS.

VISES.

LATHES.

Emery Wheels.

Belting,

MANUFACTURERS OF

WARRANTED

BLACKSMITHS', HAND, MACHINE SCREW AND NUT TAPS.

Sole Agents for GENUINE TURKEY OIL STONE.

Hubert's French Emery Paper.

Table of Iron, Steel, Copper and Brass Wire.

WEIGHT OF 100 FEET IN POUNDS. BIRMINGHAM WIRE GAUGE.

Brass and Copper Wire from 0 to 25 is numbered by Stubs' Gauge. Fine Wire from No. 26 is numbered by London Gauge.

No. of Gauge.	PER LINEAL FOOT.			
	Iron.	Steel.	Copper.	Brass.
0000	54 62	55 13	62 39	58 93
000	47 86	48 32	54 67	51 64
00	38 27	38 63	43 71	41 28
0	30 63	30 92	34 99	33 05
1	23 85	24 07	27 24	25 73
2	21 37	21 57	24 41	23 06
3	17 78	17 94	20 3	19 18
4	15 01	15 15	17 15	16 19
5	12 82	12 95	14 65	13 84
6	10 92	11 02	12 47	11 78
7	8 586	8 667	9 807	9 263
8	7 214	7 283	8 241	7 783
9	5 805	5 859	6 63	6 262
10	4 758	4 803	5 435	5 133
11	3 816	3 852	4 359	4 117
12	3 148	3 178	3 596	3 397
13	2 392	2 414	2 723	2 58
14	1 826	1 843	2 085	1 969
15	1 374	1 387	1 569	1 482
16	1 119	1 13	1 279	1 208
17	8915	9	1 018	9618
18	6363	6423	7168	6864
19	4675	472	534	5043
20	3246	3277	3709	3502
21	2714	274	31	2929
22	2079	2098	2373	2241
23	1656	1672	1892	1788
24	1283	1295	1465	1384
25	106	107	1211	1144
26	0859	0867	0981	0926
27	0678	0685	0775	0732
28	0519	0524	0593	056
29	0448	0452	0511	0483
30	0382	0385	0436	0412
31	0265	0267	0303	0286
32	0215	0217	0245	0231
33	017	0171	0194	0183
34	013	0131	0148	014
35	0066	0067	0076	0071
36	0042	0042	0048	0046

The "Acme" Fry Pan.



Patented November 14, 1876; November 5, 1878.

Made of a Single Piece.
Best Bloom Iron.
Highly Polished.

Tinned Iron Handle.
A First-Class Article.
Always Satisfactory.

FOR SALE BY ALL JOBBING HOUSES IN

HARDWARE

— AND —

TINNERS' STOCK

IN THE UNITED STATES.

NEW YORK STAMPING CO.,

SOLE MANUFACTURERS,

311 and 313 AVENUE A,

NEW YORK.

Table of Weights of Sheet Copper per Square Foot, and Thickness per English Wire Gauge.

English Wire Gauge.	Weight per square foot.	Weight of each sheet.				
		14x48	24x48	30x60	36x72	48x72
	lbs. oz.	lbs.	lbs.	lbs.	lbs.	lbs.
No. 1	14 8		116	181	261	348
2	13 14		111	174	250	334
3	12 12		102	159	230	306
4	11 9		93	145	209	278
5	10 1		81	126	182	242
6	9 6		75	118	169	226
7	8 11		70	109	157	209
8	7 14		63	99	142	190
9	7 3		58	90	130	173
10	6 8		48	81	117	156
11	5 12		46	73	104	139
12	5 1		41	64	91	122
13	4 5		35	54	78	104
14	3 9		29	45	65	86
15	3 4		26	41	59	78
16	2 14		23	36	52	70
17	2 8		20	32	45	60
18	2 2		18	27	39	52
19	1 15		16	24	35	47
20	1 12		14	22	32	43
21	1 9		13	20	29	39
22	22	6½	12	18	26	35
23	20	5⅞	10	16	23	31
24	18	5¼	9	15	21	28
25	16	4⅝	8	12½	19	25
26	14	4	7	11	15	21
27	12	3½	6	9¾	13	18
28	10	3	5	7	11	15

Stubbs' Wire Gauge in Inches.

No. 1.....5-16 in.	No. 11.....1-8 in.
" 3.....1-4 "	" 16.....1-16 "
" 7.....3-16 "	" 21.....1-32 "

Rules to be Observed in Ordering Metal or Wire.

All Metal is numbered according to Brown & Sharpe's U. S. Standard Gauge, which is known as "The New Gauge."

All Wire is numbered according to Stubs' English Wire Gauge, which is known as one of the "Old Gauges," to No. 25 inclusive; No. 26 and finer by London Gauge.

Parties ordering Metal or Wire will please make their orders to conform to above Gauges. All orders where the name of Gauge is not stated, will be filled as above. In case parties ordering Metal or Wire have no Gauge, a small piece of either material may be sent, which will answer for the Number.

For difference in Gauges see comparative table

In ordering Metal always state width and temper wanted.

In ordering Wire always state whether Hard, Soft or Spring Wire is wanted.

The term "High" Brass refers to color, and not to temper.

SEYMOUR'S SHEARS.

OVER 150 KINDS AND SIZES.

INCLUDING LADIES' SCISSORS & STRAIGHT TRIMMERS.



With MAROON and BLACK JAPANNED HANDLES.

OR WITH

NICKEL PLATED HANDLES and BLADES.

THEY ARE THE HANDSOMEST AND MOST DURABLE MADE.

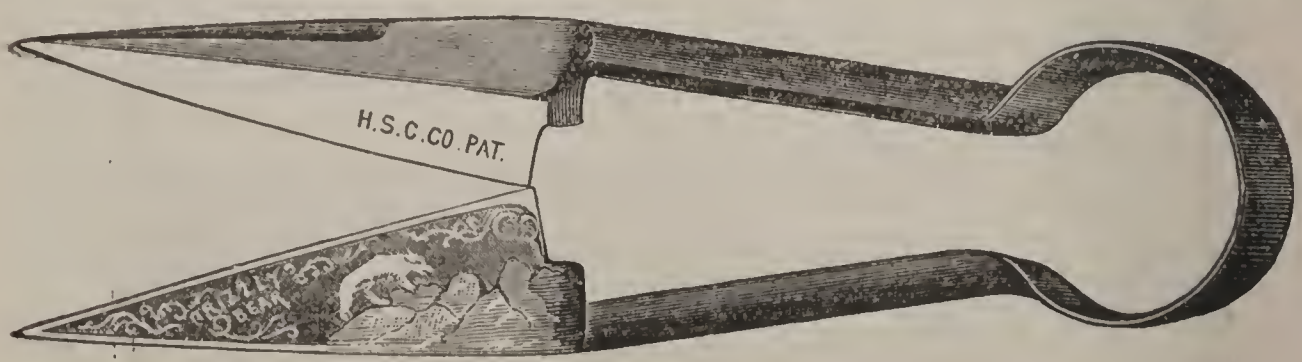
BENT TRIMMERS AND TAILORS SHEARS.

Every pair WARRANTED. Sold by all RELIABLE dealers everywhere.

DIAMOND EDGE
SOLID STEEL SHEEP SHEARS.

Warranted superior to Foreign make s.

☞ Agents Wanted in every Sheep District. ☜



Address **HENRY SEYMOUR CUTLERY CO.,** Holyoke, Mass.

WROUGHT BRASS BUTTS.

Width when Open, and Sizes of Screws Required.

WIDTH OF BRASS BUTTS, WHEN OPEN.

Size.....Inches	¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝	1¾
Narrow.....Width	⅝	⅝	⅝	¾	¾	⅞	⅞	⅞	⅞
Middle.....	¾	¾	¾	⅞	⅞	1	1	1	1
Broad.....	⅞	⅞	⅞	1	1	1⅛	1⅛	1⅛	1⅛
Desk.....	1¼	1⅜	1⅝	1¾	1⅞	2	2⅛	2¼	2½

Size.....Inches	1⅞	2	2¼	2½	2¾	3	3¼	3½	...
Narrow.....Width	1	1	1⅛	1¼	1⅜	1⅝	1¾	2	...
Middle.....	1⅛	1⅛	1¼	1⅜	1½	1¾	1⅞	2⅛	...
Broad.....	1¼	1¼	1⅜	1½	1⅝	1⅞	2	2¼	..
Desk.....	2¾	3	..	...	...	...	...	...	...

BRASS BUTTS ARE COUNTERSUNK FOR SCREWS AS FOLLOWS:

Size.....Inch	½	¾	⅞	1	1⅛	1¼	1⅜	1½	1⅝
Narrow....Size of Screw	0	1	1	2	2	3	4	4	4
Middle.....	0	1	1	2	2	3	4	4	4
Broad.....	0	1	1	2	2	3	4	4	4
Desk.....	1	2	2	4	4	4	4	5	5

Size.....Inch	1¾	1⅞	2	2¼	2½	2¾	3	3¼	3½
Narrow....Size of Screw	4	5	5	5	6	6	7	7	8
Middle.....	4	5	5	5	6	6	7	7	8
Broad.....	4	5	5	5	6	7	7	7	8
Desk.....	6	6	7	...	...	...	...	...	...

EMERY AND CORUNDUM

ARE RANKED OR GRADED AS FOLLOWS:

Nos. 8–10.....	Represents a	Wood rasp.
" 16–20.....	"	Rough file.
" 24–30.....	"	Middle cut file.
" 36–40.....	"	Bastard cut file.
" 46–60.....	"	Second cut file.
" 70–80.....	"	Smooth cut file.
" 90–100.....	"	Superfine cut file.
" 120–FFF.....	"	Dead smooth file.

Baeder & Adamson's Emery Paper and Cloth

COMPARE WITH GRADE AS FOLLOWS:

Nos.	000	00	0	100	½	1	1½	2	2½	3
Emery....	Crocus	Flour	120	100	90	80	70	60	54	46

Composition of Various Alloys.

Alloys.	Zinc.	Tin.	Copper.	Antimony	Lead.
Babbit metal		10	1	1	
Bell metal		5	16		
Brass engine bearings	¼	13	112		
" (tough) for engine-works	15	15	100		
" " for heavy bearings	5	25	160		
" yellow for turning	1		2		
" for locomotive bearings	1	7	64		
" for straps and glands	1	16	130		
Flanges to stand brazing	1		32		1
Metal to expand in cooling				2	9
Muntz's sheating	40		60		
Pewter		100		17	
Spelter	1		1		
Statuary bronze	5	2	90		
Solders.					
For lead		1			1½
" tin		1	..		2
" pewter		2			1
" brazing (soft)	3	1	4		
" " "		2		1	
" " (hard)	1		1		
" " (hardest)	1	..	8		

Specific Gravity and Weight of Metals and Alloys.

	Specific Gravity	Weight of a Cubic Foot.	Weight of a Cubic Inch.
		Lbs.	Lbs.
Aluminium, cast	2560	160	.092
Antimony, cast	6710	419	.243
Arsenic	5760		.208
Bismuth, cast	9822	613	.353
Brass, cast	7800 to 8400	500 to 527	.280 to .304
Brass, rolled about	8390	525	.302
Bronze (Copper 8, Tin 1) Gun Metal, about	8460	528	.305
Copper, cast	8750	543	.315
" rolled	8800	548	.317
" wire	8850	553	.321
Gold, pure, cast, 24 carat	19258	1204	.696
" " hammered, 24 carat about	19500	1217	.702
Iron, cast purest is common average	7210	450	.260
" wrought heaviest " "	7770	485	.280
Lead, cast	11309	708	.408
" rolled	11410	712	.411
Mercury, 40°	15630	978	.536
" 32°	13610	848	.492
" 60°	13580	846	.490
" 212°	13375	836	.483
Nickel, Plate	8801	509	318
Platinum, hammered about	21500	1343	.775
" native, in grains "	17500	..	
Silver, pure, cast	10474	654	.378
" " hammered	10510	655	.379
Steel (Carbon lightens it) common av'ge	7850	490	283
Tin (common average)	7290	455	.262
Zinc " "	7000	437	.252

Wires of Various Metals Compared.

The following table is given by Mr. David Kirkaldy, of London, to exhibit the tensile strength and resistance to tension of wire made of various materials.

Specimens Tested.	Pulling Stress per square inch.	
	Hard. Pounds.	Annealed. Pounds.
Copper	63 122	37.002
Brass	81.156	51 550
Charcoal Iron	65.834	46 60
Coke Iron	65.321	61.294
Steel	120 976	74.637
Phosphor Bronze, No. 1	159 515	58.853
" " No. 2	151.119	64.569
" " No. 3	129 141	54.111
" " No. 4	120.96[illegible]	53.371

Specimens Tested.	Extension per cent.		No. twists in 5 inches.
	Annealed.	Hard.	Annealed.
Copper	34.1	86.8	96
Brass	36.5	14.7	57
Charcoal Iron	28.	48.	87
Coke Iron	17.	26.	44
Steel	10.9	*	79
Phosphor Bronze, No. 1	46.6	13.3	66
" " No. 2	42 8	15.8	60
" " No. 3	44.9	17.3	53
" " No. 4	42.4	13.	124

Of the eight pieces of steel tested three stood from 4[illegible] to 45 twists, and five stood from 1½ to 4 twists.

Relative Malleability of the Metals.

1. Gold.
2. Silver.
3. Copper.
4. Tin.
5. Platinum.
6. Lead.
7. Zinc.
8. Iron.

Specific Resistances of Metals.

Copper	1.00	Mercury	50.00	Brass Wire	3.88
Silver	.93	Palladium	5.50	German Silver Wire	11.30
Gold	1.13	Platinum	6.7[illegible]	Nickel Wire	7.70
Iron	5 63	Tin Wire	6.80	Calcium Wire	2.61
Lead	10.76	Zinc Wire	3.70	Aluminium Wire	1 75

Conductors and Non-Conductors.

In the following list each substance named conducts better than that which precedes it; the first being the best insulator, the last the best conductor

1 Dry Air.
2 Paraffine.
3 Hard Rubber.
4 Shellac.
5 India Rubber.
6 Gutta Percha.
7 Sulphur.
8 Glass.
9 Silk.
10 Dry Paper.
11 Porcelain.
12 Dry Wood.
13 Dry Ice.
14 Water.
15 Saline Solutions.
16 Acids
17 Charcoal or Coke.
18 Mercury.
19 Lead.
20 Tin.
21 Iron.
22 Platinum.
23 Zinc.
24 Gold.
25 Copper.
26 Silver.

When a wire of small resistance and an insulator of great resistance are employed upon a line, the highest excellence is secured, since the lower the resistance in the former the better is the transmission, and the higher the resistance in the latter, the less the waste of the current.

ESTABLISHED 1854.

DICKERSON, VAN DUSEN & CO.,

29 & 31 CLIFF ST.,

Corner Fulton, NEW YORK.

DICKERSON & CO.,
Dale Street, Liverpool.

Tin Plate,
Pig Tin,
Pig Lead,
Antimony,
Ingot Copper,
Spelter.

American Sheet Iron,
Russia Sheet Iron,
Sheet Copper,
Babbitt Metal,
Sheet Zinc,
Solder.

AGENTS FOR

Cleveland Rolling Mill Co.

MANUFACTURERS OF

STEEL & IRON WIRE OF ALL KINDS.

☞ See Advertisement facing page 39. ☜

Table of Standard or Regular Tin Plates.

Size and Kind of Plates—Number and Weight of Sheets in a Box, and Wire Gauge Thickness, of every Kind and Size.

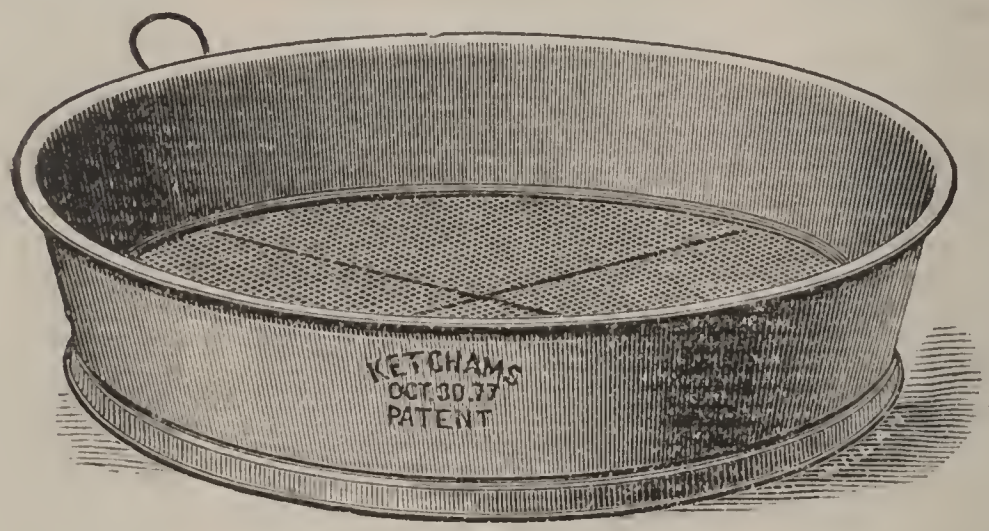
Size.	Grade.	Sheets in Box.	Pounds in Box.	Wire Gauge.
10 by 10	IC	225	78	29
"	IX	225	98	27
"	IXX	225	112	26
"	IXXX	225	124	25
"	IXXXX	225	140	24½
10 by 14	IC	225	103	29
"	IX	225	136	27
"	IXX	225	159	26
"	IXXX	225	178	25
"	IXXXX	225	200	24½
10 by 20	IC	225	156	29
"	IX	225	196	27
11 by 11	IC	225	95	29
"	IX	225	118	27
"	IXX	225	135	26
11 by 15	SDC	200	164	26
"	SDX	200	185	25
"	SDXX	200	206	24½
"	SDXXX	200	226	24
"	SDXXXX	200	248	23
22 by 15	SDC	100	164	26
"	SDX	100	185	25
"	SDXX	100	206	24½
"	SDXXX	100	226	24
"	SDXXXX	100	248	23
12½ by 17	DC	100	96	28
"	DX	100	124	26
"	DXX	100	145	24
"	DXXX	100	166	23
"	DXXXX	100	185	22
15 by 21	DX	100	183	27
"	DXX	100	214	24
"	DXXX	100	245	23
"	DXXXX	100	276	22
25 by 17	DC	50	96	28
"	DX	50	124	26
"	DXX	50	145	24
"	DXXX	50	166	23
"	DXXXX	50	185	22
14 by 20	IC	112	108	29
"	IX	112	136	27
"	IXX	112	157	26
"	IXXX	112	178	25
"	IXXXX	112	200	24½
"	IXXXXXX	112	240	23½
12 by 12	IC	225	108	29
"	IX	225	136	27
"	IXX	225	157	26
"	IXXX	225	178	25
13 by 13	IC	225	130	29
"	IX	225	164	27
"	IXX	225	190	26
"	IXXX	225	216	25
14 by 14	IC	225	152	29
"	IX	225	192	27
"	IXX	225	221	26
"	IXXX	225	250	25
"	IXXXX	225	279	24½
15 by 15	IX	225	221	27
"	IXX	225	255	26
"	IXXX	225	288	25
"	IXXXX	225	322	24½
16 by 16	IC	225	200	29
"	IX	225	252	27
"	IXX	225	290	26
"	IXXX	225	328	25
"	IXXXX	225	368	24½
17 by 17	IX	112	140	27
"	IXX	112	162	26
"	IXXX	112	184	25
"	IXXXX	112	205	24½
18 by 18	IX	112	158	27
"	IXX	112	182	26
"	IXXX	112	206	25
"	IXXXX	112	231	24½
22 by 22	IXX	56	135	26
"	IXXX	56	...	25
"	IXXXX	56	...	24½
24 by 24	IXX	56	157	26
"	IXXX	56	...	25
"	IXXXX	56	...	24½
Terne Plates.				
14 by 20	IC	112	108	29
"	IX	112	136	27
20 by 28	IC	112	216	29
"	IX	112	272	27
20 by 200	IC		172	29
"	IX		216	27
Tin Taggers.				
10 by 14		450	108	38
Black Taggers.				
10 by 14		256	108	32
"		300	108	34
"		360	108	36
"		450	108	38

E. KETCHAM & CO.,

Manufacturers of

STAMPED, PIECED and JAPANNED

TINWARE,



PATENT METALLIC SIEVES.

96 Beekman Street and 53 Cliff Street,

NEW YORK.

FACTORIES:

Brooklyn, N. Y.

ADDRESS:

P. O. Box 2,517,
New York.

From the "Metal Worker."

Cost of Tin Roofing.

The following table shows the cost per square and per square foot of tin roofing, laid with 14x20 tin, with tin at any price from $4 to $10 per box. The first column contains the price per box of tin; the second column shows the cost of tin per square (100 square feet) of surface, and the third column shows the cost of tin per square foot of surface:

FLAT SEAM ROOFING—COST WITH 14x20 TIN.

Price of tin per box.	Cost per square of flat roof 14x20 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of flat roof 14x20 tin.	Cost per sq. foot.
$4.25	$2.21	.0221	$8.25	$4.29	.0429
4.50	2.34	.0234	8.50	4.42	.0442
4.75	2.47	.0247	8.75	4.55	.0455
5.00	2.60	.0260	9.00	4.68	.0468
5.25	2.73	.0273	9.25	4.81	.0481
5.50	2.86	.0286	9.50	4.94	.0494
5.75	2.99	.0299	9.75	5.07	.0507
6.00	3.12	.0312	10.00	5.20	.0520
6.25	3.25	.0325	10.25	5.33	.0533
6.50	3.38	.0338	10.50	5.46	.0546
6.75	3.51	.0351	10.75	5.59	.0559
7.00	3.64	.0364	11.00	5.72	.0572
7.25	3.77	.0377	11.25	5.85	.0585
7.50	3.90	.0390	11.50	5.98	.0598
7.75	4.03	.0403	11.75	6.11	.0611
8.00	4.16	.0416	12.00	6.24	.0624

STANDING SEAM ROOFING—COST WITH 14x20 TIN.

Price of tin per box.	Cost per square of standing seam roof with 14x20 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of standing seam roof with 14x20 tin.	Cost per sq. foot.
$4.25	$2.37	.0237	$7.25	$4.03	.0403
4.50	2.51	.0251	7.50	4.17	.0417
4.75	2.65	.0265	7.75	4.31	.0431
5 00	2.79	.0279	8.00	4.45	.0445
5.25	2.93	.0293	8.25	4.59	.0459
5.50	3.06	.0306	8.50	4.73	.0473
5 75	3.20	.0320	8.75	4.87	0487
6.00	3.34	.0334	9.00	5.01	.0501
6.25	3.48	.0348	9.25	5.15	.0515
6.50	3.62	.0362	9.50	5.29	.0529
6.75	3 76	.0376	9.75	5.43	.0543
7.00	3.90	.0390	10.00	5.57	.0557

IRON CLAD MANUFACTURING CO.

LARGEST MANUFACTURERS OF

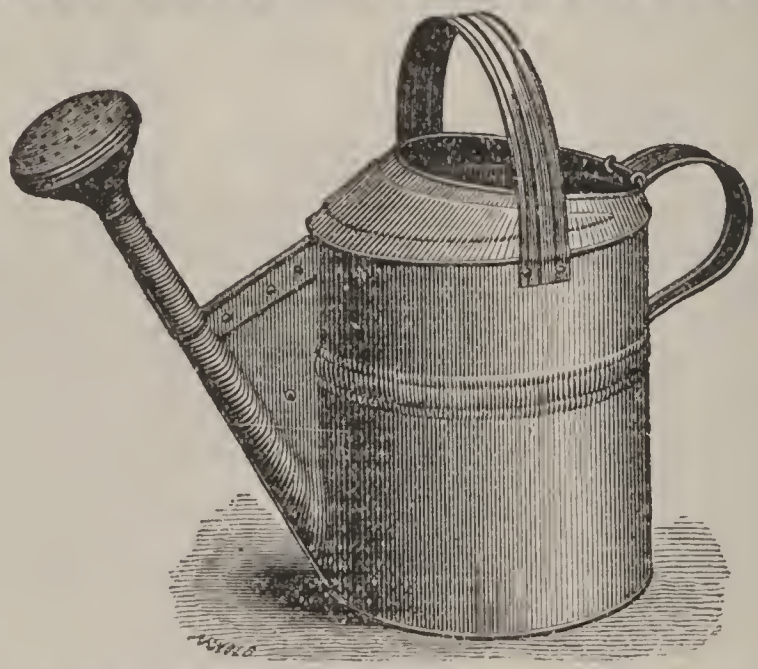
Galvanized Sheet Iron Goods

IN THE UNITED STATES,

SUCH AS

COAL HODS, ASH CANS,

WATER and FIRE BUCKETS,



Galvanized Iron Sprinklers,

Refrigerator or Drip Pans,

Well Buckets, Oil Tanks, &c.

Also, Manufacturers of the Justly Celebrated

IRON CLAD MILK CANS,

In New York, Philadelphia, Cincinnati, Baltimore, Chicago, Boston, and St. Louis Patterns.

STAMPED WARE AND TINNERS' TRIMMINGS.

Fry Pans, Rivets, &c.

Iron Clad Manufacturing Co.,

22 CLIFF ST., NEW YORK.

Cost of Tin Roofing—Continued.

The following table shows the cost per square and per square foot of tin roofing, laid with 20x28 tin, with tin at any price from $8 to $24 per box. The first column contains the price per box of tin; the second column shows the cost of tin per square (100 square feet) of surface, and the third column shows the cost of tin per square foot of surface.

FLAT SEAM ROOFING—COST WITH 20x28 TIN.

Price of tin per box.	Cost per square of flat seam roof 20x28 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of flat seam roof 20x28 tin.	Cost per sq. foot.
$8.00	$2.01	.0201	$16.00	$4.01	.0401
8.50	2.13	.0213	16.50	4.13	.0413
9.00	2.26	.0226	17.00	4.26	.0426
9.50	2.38	.0238	17.50	4.38	.0438
10.00	2.51	.0251	18.00	4.51	.0451
10.50	2.63	.0263	18.50	4.63	.0463
11.00	2.76	.0276	19.00	4.76	.0476
11.50	2.88	.0288	19.50	4.88	.0488
12.00	3.00	.0300	20.00	5.01	.0501
12.50	3.13	.0313	20.50	5.13	.0513
13.00	3.25	.0325	21.00	5.26	.0526
13.50	3.38	.0338	21.50	5.38	.0538
14.00	3.50	.0350	22.00	5.51	.0551
14.50	3.63	.0363	22.50	5.63	.0563
15.00	3.75	.0375	23.00	5.76	.0576
15.50	3.88	.0388			

STANDING SEAM ROOFING—COST WITH 20x28 TIN.

Price of tin per box.	Cost per square of standing seam roof with 20x28 tin.	Cost per sq. foot.	Price of tin per box.	Cost per square of standing seam roof with 20x28 tin.	Cost per sq. foot.
$8.00	$2.15	.0215	$16.50	$4.42	.0442
8.50	2.28	.0228	17.00	4.56	.0456
9.00	2.41	.0241	17.50	4.69	.0469
9.50	2.55	.0255	18.00	4.82	.0482
10.00	2.68	.0268	18.50	4.96	.0496
10.50	2.82	.0282	19.00	5.09	.0509
11.00	2.95	.0295	19.50	5.23	.0523
11.50	3.09	.0309	20.00	5.36	.0536
12.00	3.21	.0321	20.50	5.49	.0549
12.50	3.35	.0335	21.00	5.63	.0563
13.00	3.48	.0348	21.50	5.76	.0576
13.50	3.62	.0362	22.00	5.90	.0590
14.00	3.75	.0375	22.50	6.03	.0603
14.50	3.89	.0389	23.00	6.17	.0617
15.00	4.02	.0402	23.50	6.30	.0630
15.50	4.15	.0415	24.00	6.43	.0643
16.00	4.29	.0429			

ROMER & CO.

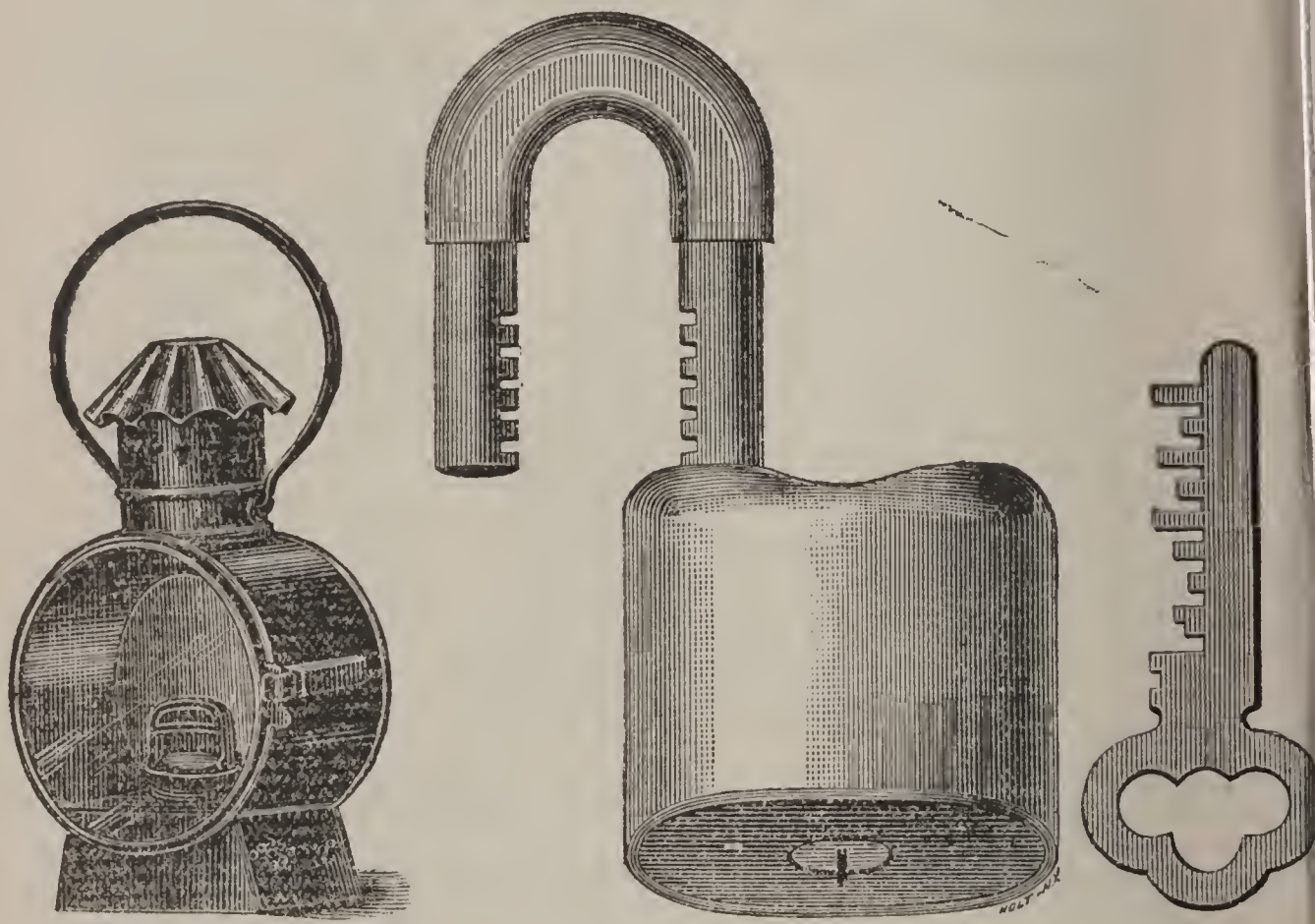
28 to 42 SUMMER AVE.,

(Corner of Seventh Avenue),

NEAR D. L. & W. R. R. DEPOT,

(Bloomfield Avenue Horse Cars pass the door),

NEWARK, N. J.,



MANUFACTURERS OF EVERY DESCRIPTION OF

Brass and Iron Padlocks,

— AND —

FLAT KEYED, SCANDINAVIAN OR JAIL PADLOCKS.

— ALSO —

Dash and Carriage Lamps, Lanterns, &c.

Illustrated Catalogues will be sent to the Trade upon application.

RUSSIA SHEET IRON.

	Size.	Weight per Sheet.	Wire Gauge.
No. 7.....	28x56 in.	6¼ lbs.	No. 29
" 8.....	"	7¼ "	" 28
" 9.....	"	8 "	" 27
" 10.....	"	9 "	" 26
" 11.....	"	10 "	" 25
" 12.....	"	10¾ "	" 24½
" 13.....	"	11¾ "	" 24
" 14.....	"	12½ "	" 23¼
" 15.....	"	13½ "	" 22⅝
" 16.....	"	14½ "	" 21½

SHEET ZINC.

Zinc Gauge.	Stubs' Wire Gauge.	Weight per sq. foot.	Approximate Weight per sheet.							
			24 x 84	26 x 84	28 x 84	30 x 84	32 x 84	34 x 84	36 x 84	40 x 84
		oz.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
6	29	7	6⅛	6⅝	7⅛	7⅝	8¼	8¾	9¼	
7	28½	8	7	7⅝	8⅛	8¾	9⅜	9⅛	10½	
8	28	9	7⅞	8½	9¼	9⅞	10½	11⅛	11¾	
9	27	10½	9¼	10	10¾	11½	12¼	13	13¾	
10	26	12	10½	11½	12	13	14	15	16	
11	25	13½	12	13	14	15	16	17	18	
12	24	15	13	14	15	16½	17½	18½	20	
13	23	17	15	16	17	18½	20	21	22	25
14	22	19	17	18	19½	21	22	23½	25	28
15	21	22	19	21	22½	24	25½	27	29	32
16	20	25	22	24	25½	27	29	31	33	36
17	19	28	25	27	29	31	33	35	37	41
18	18	31	27	30½	32	34	36	38	41	45
19	17	35	31	33	36	38	41	44	46	51
20	16	40	35	38	41	44	47	50	53	59

SHEET LEAD

IS MADE TO WEIGH, PER SQUARE FOOT:

2½. 3, 3½ 4, 4½, 5, 6, 7, 8, 9, 10 pounds, and upwards.

West Side Galvanizing Works.

HOOPES & MERRY,

535 to 547 WEST 15TH STREET, NEW YORK.

MANUFACTURERS OF

The "LION" and "PHOENIX" Brands of

GALVANIZED SHEET IRON.

All grades of Black Sheet Iron kept in stock. Corrugated Iron for Roofing or Siding.

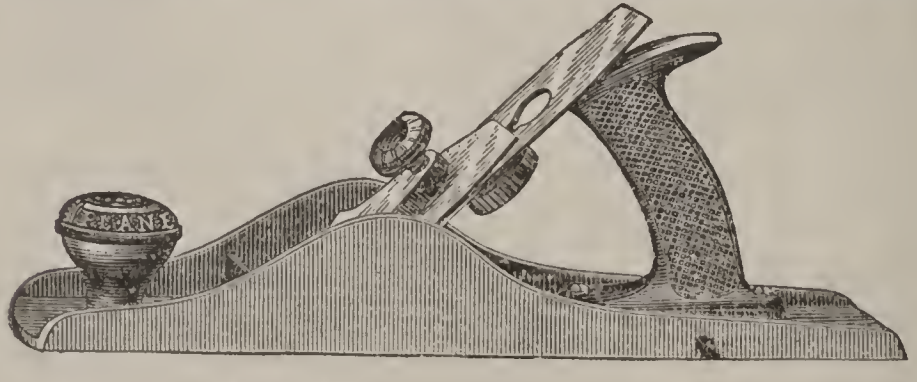
Tin Plates, Solder, Sheet Zinc, Slating and Roofing Nails, Tinned, Galvanized and Black.

All kinds of Iron Work Galvanized or Tinned to Order.

LEONARD BAILEY & CO.,

MANUFACTURERS OF THE

"VICTOR" PATENT ADJUSTABLE



BENCH PLANES.

— ALSO —

SPOKE SHAVES, BOX SCRAPERS, &c.

FACTORY, HARTFORD, CONN.

Sold by all Hardware Dealers.

☞ Illustrated Circulars furnished to Dealers on application.

[From "The Metal Worker."]

GALVANIZED SHEET IRON.

TABLE, Showing Gauges, with Weights per Square Foot; List Price per Pound; Cost per Square Foot at List, together with Cost per Pound and per Square Foot at Different Discounts, ranging from 25 per cent. to 55 per cent.

In this Table prices are calculated to three places of decimals, which is sufficiently accurate for all practical purposes.

Gauge Number		26	21	22	23	24	25	26	27	28
Weight per square foot, oz		23	24	21	19	17	16	15	14	13
List price per pound		.12	.13	.13	.13	.13	.14	.14	.15	.16
Cost per square foot at List		.21	.195	.171	.154	.138	.14	.131	.131	.13
Cost 25 per cent. Discount	per lb	.09	.098	.098	.098	.098	.105	.105	113	.12
	per square foot	.158	.146	.128	.116	.104	.105	.098	.098	.098
" 27½ " "	per lb	.087	.094	.094	.094	.094	.102	.102	.109	.116
	per square foot	.152	.141	.124	.112	.10	.102	.095	.095	.094
" 30 " "	per lb	.084	.091	.091	.091	.091	.098	.098	.105	.112
	per square foot	.147	.137	.119	.108	.097	.098	.092	.092	.091
" 32½ " "	per lb	.081	.088	.088	.0 8	.088	.095	.095	.101	.108
	per square foot	.142	.132	.115	.104	.093	.095	.089	.089	.088
" 33⅓ " "	per lb	.08	.087	.087	.087	.087	.093	.093	.10	.107
	per square foot	.14	.13	.114	.103	.092	.093	.088	.088	.087
" 35 " "	per lb	.078	.085	.085	.085	.085	.091	.091	.098	.104
	per square foot	.137	.127	.111	.10	.09	.091	.085	.085	.085
" 37½ " "	per lb	.075	.081	.081	.081	.081	.088	.088	.094	.10
	per square foot	.131	.122	.107	096	.086	.088	.082	.082	.081
" 40 " "	per lb	.072	078	.078	.078	.078	.084	084	.09	.096
	per square foot	.126	.117	.102	.093	.083	.084	.079	.079	078
" 42½ " "	per lb	.069	075	.075	.075	.075	.081	081	.086	.092
	per square foot	.121	.112	.098	.089	.079	.081	.075	.075	.075
" 45 " "	per lb	066	.072	072	.072	.072	.077	.077	.083	.088
	per square foot	.116	.107	.094	.085	.076	.077	.072	.072	.072
" 47½ " "	per lb	.063	.068	.063	.068	.068	.074	.074	.079	.084
	per square foot	.11	.102	.09	.081	.073	.074	069	.069	.068
" 50 " "	per lb	.06	.065	.065	.065	.065	.07	.07	.075	.08
	per square foot	.105	.098	085	.077	.069	.07	.066	.066	.065
" 52½ " "	per lb	.0 7	.062	.062	.062	.062	067	.067	.071	.076
	per square foot	.10	.093	.081	.073	.066	.0 7	062	.062	.062
" 55 " "	per lb	.054	.059	059	.059	.059	.063	.063	.068	.072
	per square foot	.095	.088	077	060	.062	.063	.059	059	.059

HORACE F. SISE,

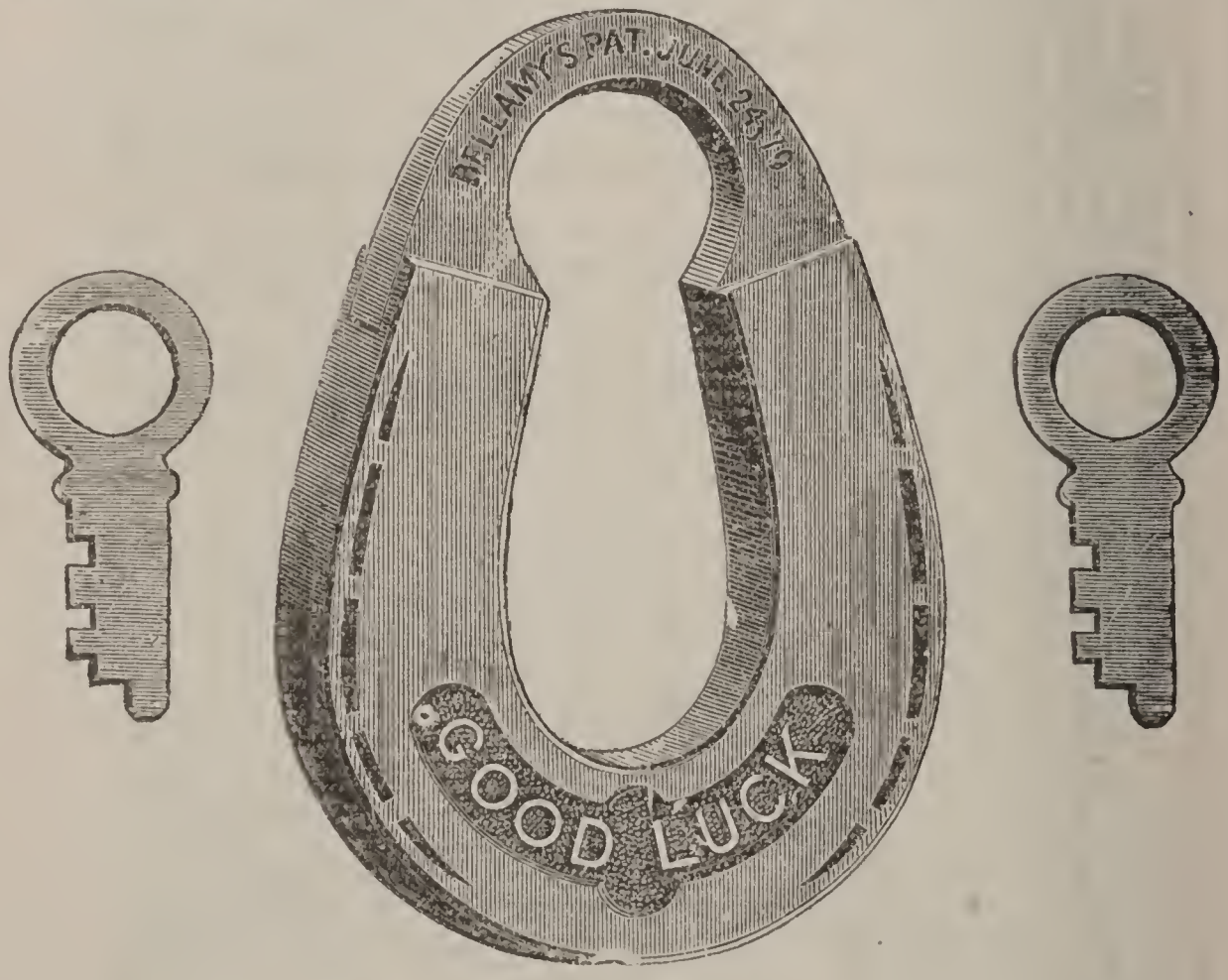
Hardware Manufacturers' Agent,

100 Chambers Street,

NEW YORK.

CAST BRONZE

HORSE SHOE PADLOCKS,



Patented June 24, 1879.

No. 610. (50)

Size, 2 1/4 in.

No. 610—With two Flat Steel Keys each.....	per doz.	$9.00
Extra Keys to Lock, or sample Key....	"	1.80
Key Blanks	"	90

Packed 1/2 dozen in a box.

ROOFING SLATE.

GENERAL RULE FOR THE COMPUTATION OF SLATE.

From the length of the slate take three inches, or as many as the third covers the first; divide the remainder by 2, and multiply the quotient by the width of the slate, and the product will be the number of square inches in a single slate. Divide the number of square inches thus procured by 144, the number of square inches in a square foot, and the quotient will be the number of feet and inches required. A square of slate is what will cover 100 feet square, when properly laid upon the roof.

TABLE OF SIZES AND NUMBER OF SLATES IN ONE SQUARE.

Size in Inches.	No. of Slate in a Square.	Size in Inches.	No. of Slate in a Square.	Size in Inches.	No. of Slate in a Square.	Size in Inches.	No. of Slate in a Square
6x12	533	9x14	291	10x18	192	11x22	137
7x12	457	10x14	261	1.x18	174	1 x22	123
8x12	400	12x14	218	12x18	160	1'x22	1'8
9x12	355	8x16	2:7	14x18	137	12x24	114
10x12	320	9x16	246	10x20	169	14x24	98
12x12	2'6	10x16	221	11x20	154	16x24	86
7x14	:74	12x16	185	12x20	141	14x26	89
8x14	3 7	9x18	213	14x20	121	16x26	78

The weight of a square of Slate is estimated in a general way (varying according to the thickness of the different makes) at from 600 to 700 lbs. per square.

Metal Supplies for Tinners.

REGULAR QUANTITIES IN WHICH THEY ARE SOLD.

Sheet Iron.....	English, about	125 lbs.	in bundle.
Common or R.G....	American, "	140 "	"
Galvanized.....	"	145 "	"
Widths.....24 to 30 inches.			
Lengths.....72 to 96 "			
"Russia" Sheet Iron (28 by 56).....		240 lbs.	in bundle.
Pig Tin, "English," in Pigs of		28, 56, and 84 lbs.	each.
" "Straits," "		of 75 to 100 "	
" "Banca," "		70 "	
Pig Lead, "		120 to 150 "	
Spelter, in slabs,		of 20 to 70 "	
Wire, in bundles		of 63 "	
" Galvanized, American, in bundles		of 63 "	
" " English, "		100 "	

COLWELL LEAD CO.,

63 CENTRE STREET,

NEW YORK,

MANUFACTURERS OF

AMERICAN STANDARD SHOT,

OF SUPERIOR FINISH.

Drop Shot, Buck Shot, Chilled Shot,

— AND —

BAR LEAD.

SHEET LEAD and LEAD PIPE.

— ALSO, DEALERS IN —

PIG LEAD.

PLUMBERS', STEAM AND GAS FITTERS' SUPPLIES

OF ALL KINDS.

STANDARD WEIGHTS OF LEAD PIPE, Etc.

WEIGHT PER FOOT OF LEAD PIPE AND TIN-LINED LEAD PIPE.

Calibre.	AAA Brooklyn.		AA Ex Strong		A Strong.		B Medium.		C Light.		D Ex Light		E Fountain.	
	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz	Lb.	Oz.	Lb.	Oz.
⅜	1	8	1	5	1	2	1	0	0	13	0	10	0	8
½	3	0	2	0	1	12	1	4	1	0	0	13	0	11
⅝	3	8	2	12	2	8	2	0	1	12	1	8	1	0
¾	4	8	3	8	3	0	2	4	2	0	1	12	1	4
1	6	0	4	12	4	0	3	4	2	8	2	0	1	8
1¼	6	12	5	12	4	12	3	12	3	0	2	8	2	0
1½	9	0	8	0	6	4	5	0	4	4	3	8	3	4
2	10	12	9	0	7	0	6	0	5	4	4	0		

LEAD WASTE PIPE.

1½ inch, 2lbs.....per foot.
2 " 3 lbs..... "
2½ " 4 and 6 lbs.... "
3 " 3½, 4½ & 5 lbs. "

4 inch, 4½, 5, 6 & 8 lbs...per foot.
4½ inch, 6, 6¾ & 8 lbs... "
5 inch, 8, 10 & 12 lbs.... "
6 " 9¾ and upwards.. "

EXTRA WEIGHTS OF LEAD PIPE.

Calibre.	7-16 Thick.		⅜ Thick.		5-16 Thick		¼ Thick.		3-16 Thick.	
	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.	Lb.	Oz.
2½ inches..	0	0	16	11	13	11	11	0	7	13
3 " ..	0	0	19	10	16	0	12	0	9	0
3½ " ..	26	10	21	10	18	5	15	0	9	8
4 " ..	30	0	25	0	21	0	16	0	12	8
4½ " ..	0	0	0	0	0	0	18	0	14	0
5 " ..	0	0	31	0	0	0	20	0	0	0

PATENT FINISH DROP SHOT.

AMERICAN STANDARD SIZES.

	Diameter in 100ths of an inch.	No of Shot to the oz
Extra Fine Dust..	1⅛	84021
Fine Dust.....	3	10784
Dust.....	4	4565
No. 12.....	5	2326
" 11.....	6	1346
" 10.....Trap Shot		1056
" 10.....	7	848
" 9.....Trap Shot		688
" 9.....	8	568
" 8.....Trap Shot		472
" 8.....	9	399
" 7.....Trap Shot		338
" 7.....	10	291

	Diameter in 100ths of an inch.	No. of Shot to the oz.
No. 6.....	11	218
" 5.....	12	168
" 4.....	13	132
" 3.....	14	106
" 2.....	15	86
" 1.....	16	71
" B.....	17	59
" BB.....	18	50
" BBB.....	19	42
" T.....	20	36
" TT.....	21	31
" F.....	22	27
" FF.....	23	24

COMPRESSED BUCK SHOT.

	Diameter in 100ths of an inch.	No. of Balls to the lb
No. 3.....	25	284
" 2.....	27	232
" 1.....	30	173
" 0.....	32	140

	Diameter in 100ths of an inch.	No. of Balls to the lb.
No. 00.....	34	115
" 000.....	36	94
Balls.....	38	85
"	44	50

Weight and Dimensions of Wrought Iron Welded Pipes.

FOR GAS, STEAM AND WATER.

Inside Diameter in inches.	Outside Diameter in inches.	Weight per foot in pounds.	Inside Diameter in inches.	Outside Diameter in inches.	Weight per foot in pounds.
⅛	0.40	0.24	3	3 5	7.54
¼	0.54	0.42	3½	4.0	9.05
⅜	0.67	0.56	4	4.5	10.72
½	0.84	0.85	4½	5.0	12.49
¾	1.05	1.12	5	5.56	14.56
1	1.31	1.67	6	6.62	18.77
1¼	1 66	2.25	7	7.62	23.41
1½	1 95	2.69	8	8 62	28.35
2	2.37	3.66	9	9.68	34.07
2½	2.87	5.77	10	10 75	40.64

Lap Welded American Charcoal Iron Boiler Tubes.

TABLE OF STANDARD SIZES.

External Diameter.	External Circumference.	Internal Diameter.	Internal Circumference.	Thickness.	Length of Pipe per sq. ft. of inside surface.	Length of Pipe per sq. ft. of outside surface.	Internal Area.	External Area.	Weight per foot.
Ins.	Ins.	Ins.	Ins.	Ins.	Feet.	Feet.	Ins.	Ins.	lbs.
1	3.142	0.856	2.689	0 072	4.460	3.819	0 575	0.785	0.703
1¼	3 927	1.126	3.474	0.072	3.455	3 056	0 960	1.227	0.9
1½	4.712	1.334	4.191	0.083	2.863	2.547	1 396	1.767	1.250
1¾	5.598	1.560	4 901	0.095	2 448	2.183	1.911	2.405	1.365
2	6.283	1.864	5.667	0.093	2.118	1.909	2.556	3. 42	1 981
2¼	7 069	2 054	6.484	0.098	1.850	1.698	3.314	3.976	2.238
2½	7.854	2.283	7.172	0.109	1.673	1.528	4.094	4 939	2.755
2¾	8.639	2.533	7.957	0.109	1.508	1.390	5. 39	5.940	3.045
3	9.425	2.783	8.743	0 109	1.3.3	1.273	6.083	7 069	3 333
3¼	10.210	3 012	9.462	0 119	1.268	1 175	7 125	8.293	3.958
3½	10 9 5	3.262	10.248	0.119	1 171	1.091	8.357	9.621	4.272
3¾	1.781	3.5 2	11.033	0.119	1.088	1.018	9.687	11 045	4 590
4	12.566	3.741	11.753	0.130	1.023	0.955	10 992	12 566	5.320
4½	14.137	4.241	13.323	0.130	0.901	0.849	14.123	15.904	6 010
5	15.708	4.72	14.818	0 140	0 809	0.764	17.497	19.635	7.226
6	18 849	5 699	17 904	0 151	0.670	0.637	25.509	28.274	9.346
7	21.991	6 657	20 911	0 172	0.574	0 545	34.805	38 484	12 435
8	25.132	7.635	3.989	0 182	0.500	0 478	45.795	50.265	15.109
9	28.374	8.615	27.055	0.193	0.444	0.424	58.291	63.617	18.002
10	31.416	9.593	30.074	0 214	0.399	0.382	71.975	78.540	22.19

Light Wrought Iron Artesian Tube and Casing for Oil Wells.

STANDARD SIZES.

Outside Diameter in inches.	Inside Diameter in inches.	Weight per Foot, Pounds.	Outside Diameter, Inches.	Inside Diameter, Inches.	Weight per Foot, Pounds.
1¾	1½	1 665	4¼	4	5 500
2¼	2	2.228	4½	4¼	6.010
2½	2¼	2.755	5	4¾	7.226
2¾	2½	3.045	5¼	5	7.667
3	2¾	3 333	5½	5 3-16	8.083
3¼	3	3.958	6	5⅝	9 346
3½	3¼	4.272	6⅝	6¼	10 054
3¾	3½	4.950	7	6⅝	12 455
4	3¾	5.320	8	7⅝	15.109
			8¼	8¼	15 155

Sizes of Tanks and Contents.

Diameter.	Depth.	Gallons.	Diameter	Depth.	Gallons.
Feet.	Feet.		Feet.	Feet.	
12	8	6,767	24	12	40,607
14	9	10 363	26	13	51,628
16	9	13,535	28	14	64,481
18	10	19.034	30	15	79,310
20	10	23.499	32	16	96,153
22	11	31 277	34	17	115,451

Capacity of Cisterns and Reservoirs in Gallons.

DEPTH 10 INCHES; DIAMETER FROM 2 TO 25 FEET.

2 feet 19.5	5 feet ..122.40	8 feet ..313 33	12 feet ... 705.				
2½ " 30.6	5½ " ..148.10	8½ " ..353.72	13 " ... 827.4				
3 " 44.06	6 " ..176.25	9 " ..396.56	14 " 959.6				
3½ " 59.97	6½ " ..206.85	9½ " ..461.40	15 " ...1,101.6				
4 " .. .78.33	7 " ..239.88	10 " ..489.20	20 " ...1,958.4				
4½ " 99 14	7½ " ..275.40	11 " ..592.40	25 " ...3,059 9				

CAPACITY OF BOXES.—A box 24 inches long by 16 inches wide, and 28 inches deep, will contain a barrel (3 bushels).

A box 24 inches long by 13 inches wide, and 14 inches deep, will contain half a barrel.

A box 16 inches square and 8.4 inches deep, will contain one bushel.

A box 8 inches by 8.4 inches square, and 8 inches deep, will contain one peck.

A box 8 inches by 8 inches square, and 4.2 inches deep, will contain one gallon.

Table of Dimensions of Various Measures of Capacity.

Size.	Diameter of Top.	Diameter of Bottom.	Height.
	Inches.	Inches.	Inches.
1 gallon.	5⅝	6⅞	9¾
½ "	4	4⅞	8
1 quart..	3⅜	4	5¾
1 gallon	4	7	8½
½ "	6¼	4	4
5 "	8	1 ¼	12⅞
3 "	7	11⅜	10¼
2 "	6	10⅛	8⅞
1 "	3¾	8¾	7¾
20 quarts.	19⅛	13	8
16 "	18	11 ¼	6¼
14 "	15¼	9¼	6½
10 "	14¾	11	4⅛
1 pint....	2⅛	3⅛	4¼
½ "	2⅜	2⅞	3⅛
3 quarts	3½	6	8½
1 pint....	4⅜	3¾	2¾
½ gallon.	3½	6¼	6¼
¼ "	2¼	5⅛	5
1 "	2	4¼	4⅛
½ "	1¾	3¼	3⅛
2 quarts.	9	6	8⅛
3 pints..	6¼	5¾	8¾
1 pint...	6¼	4	2¾
Pie.....	9	7⅛	2¾
			1¾



The **only** machine that received an award on both Horse-power and Thresher and Cleaner, at the Centennial Exhibition: was awarded the two last **Gold Medals** given by the New York State Agricultural Society on Horse-powers and Threshers; and is the **only** Thresher selected from the vast number built in the United States, for illustration and description in "Appleton's Cyclopedia of Applied Mechanics," recently published, thus adopting it as the **standard** machine of this country. Buy **the best.** It is **cheapest** in the end. Catalogue sent free. Address, MINARD HARDER, Cobleskill, Schoharie Co., N. Y.

Empire Agricultural Works,

ESTABLISHED IN 1859.

MINARD HARDER,

MANUFACTURER OF

Horse Powers and Threshers & Cleaners,

THRESHERS, SEPARATORS, FANNING-MILLS & CIRCULAR-SAW MACHINES,

COBLESKILL, N. Y.

WORKSHOP RECIPES.

Cement to Resist Fire and Water, and Harden Quickly.

Two parts finely sifted unoxodized iron filings.
One part, perfectly dry, finely powdered loam.
Knead the mixture with strong vinegar into a homogeneous plastic mass, to be used as soon as made.

To Soften Putty.

To remove old putty from broken windows, dip a small brush in nitro-muriatic acid or caustic soda (concentrated lye), and with it annoint or paint over the dry putty that adheres to the broken glass and frames of your windows; after an hours interval, the putty will have become so soft as to be easily removable.

Painter's Putty.

Spanish whiting, pulverized.....	80.6	Made into a stiff paste. If not intended for immediate use, raw oil should be used.
Boiled Oil.....	20.4	

One pound of putty for stopping every 20 yards.

Glazier's Putty.

Whiting, 70 pounds; boiled oil, 30 pounds; water, 2 gallons. Mix. If too thin add more whiting; if too thick, add more oil.

Cement for Stopping Joints, Etc.

White lead in oil, mixed with enough white sand to make it a stiff paste. This grows hard by exposure, and resists heat, cold and water.

Cement for Leather Belting.

Take of common glue and American isinglass, equal parts; place them in a boiler and add water sufficient to cover the whole. Let it soak 10 hours, then bring it to a boiling heat, and add pure tannin until the whole becomes ropey or appears like the whites of eggs. Apply it warm. Buff the grain off the leather where it is to be cemented; rub the joint surfaces solidly together, let it dry a few hours, and it is ready for practical use; and, if properly put together, it will not need riveting, as the cement is nearly of the same nature as the leather itself.

To Remove Rusty Bolts.

To remove bolts that have become rusted badly, without breaking them, is quite simple if understood. The best method is to apply kerosene oil liberally, and give time for it to soften the rust before any attempt is made to turn the nut. If, after the rust has softened, it does not start easily with the wrench, give a rap on one corner with a blow of the hammer. A hammer and cold chisel rightly used will often start a rusted nut that would not yield to the wrench without twistiug off the bolt.

How to Prepare Fence Posts.

A western farmer says that he discoverd many years ago that wood could be made to last longer than iron in the ground. Time and weather, he says, seem to have no effect on it. Posts can be prepared for less than two cents apiece. This is the recipe: Take boiled linseed oil and stir it in pulverized charcoal to the consistency of paint. Put a coat of this over the timber, and, he adds, there is not a man that will live to see it rot.

A Practical Rule for Laying Pipe for Draining Land.

Soils.	Depth of Pipe.	Distance apart.
Coarse Gravel Sand.....	4 feet 6 inches.....	60 feet.
Light Sand with Gravel.....	4 "	50 "
Light Loam.....	3 " 6 "	33 "
Loam with Clay.....	3 " 2 "	21 "
" " Gravel.....	3 " 3 "	27 "
Sandy Loam.....	3 " 9 "	40 "
Soft Clay.....	2 " 9 "	21 "
Stiff "	2 " 6 "	15 "

Greatest Fall of Rain is 2 inches per hour=54308.6 galls. per acre.

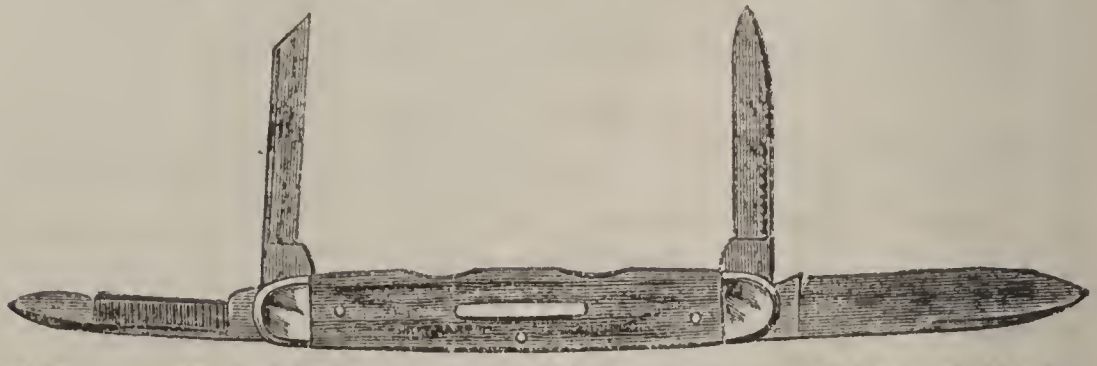
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THE NORFOLK SHEAR COMPANY,

MANUFACTURERS OF

SHEARS AND SCISSORS.

Value of Iron.

VALUE PER GROSS TON (2240 LBS.) OF IRON AT FROM 1-10TH OF A CENT TO 10 CENTS PER POUND, INCREASING AT RATE OF 1-10TH OF A CENT PER POUND.

Per lb. in cts. & 1-10ths.	Price Per Ton	Per lb. in cts. & 1-10ths.	Price Per Ton	Per lb. in cts. & 1-10ths.	Price Per Ton
1-10	$ 2.24	3 5-10	$ 78.40	6 8-10	$152.32
2-	4.48	6-	80.64	9-	154.56
3-	6 72	7-	82.88	7	156.80
4-	8.96	8-	85.12	1-10	159.04
5-	11.20	9-	87.36	2-	161.28
6-	13.44	4	89.60	3-	163 52
7	15.68	1-10	91.84	4-	165.76
8-	17.92	2-	94.08	5-	168 00
9-	20.16	3-	96.32	6-	170.24
1	22 40	4-	98.56	7-	172.48
1-10	24.64	5-	100.80	8-	174.72
2-	26.88	6-	103.04	9-	176.96
3-	29.12	7-	105.28	8	179 20
4-	31.36	8-	107.52	1-10	181.44
5-	33.60	9-	109.76	2-	183.68
6-	35.84	5	112.00	3-	185 92
7-	38.08	1-10	114 24	4-	188.16
8-	40.32	2-	116.48	5-	190.40
9-	42.56	3-	118.72	6-	192.64
2	44.80	4-	120.96	7-	194.88
1-10	47.04	5-	123.20	8-	197.12
2-	49.28	6-	125.44	9-	199.36
3-	51.52	7-	127.68	9	201.60
4-	53 76	8-	129.92	1-10	203.84
5-	56 00	9-	132.16	2-	206.08
6-	58.24	6	134.40	3-	208.32
7-	60.48	1-10	136.64	4-	210 56
8-	62 72	2-	138.88	5-	212.80
9-	64.96	3-	141.12	6-	215.04
3	67.20	4-	143.36	7-	217.28
1-10	69.44	5-	145.60	8-	219.52
2-	71.68	6-	147.84	9-	221.76
3-	73.92	7-	150.08	10	224.00
4-	76.16				

Hoop and Scroll Iron.

NUMBER OF FEET IN A BUNDLE OF FIFTY-SIX POUNDS.

HOOP IRON.			SCROLL IRON.		
Size.		Feet in Bundle.	Size.		Feet in Bundles.
Width.	Thick.		Width.	Thick.	
⅝ inches.	No. 21	815	½ inches	No. 10	240
¾ "	" 20	630	⅝ "	" 16	439
⅞ "	" 19	450	⅝ "	" 14	347
1 "	" 13	361	⅝ "	" 10	190
1⅛ "	" 17	278	¾ "	" 16	360
1¼ "	" 13	217	¾ "	" 14	299
1⅜ "	" 15	160	¾ "	" 12	208
1½ "	" 15	139	¾ "	" 10	160
2 "	" 14	110	⅞ "	" 16	310
			⅞ "	" 14	249
			⅞ "	" 12	175
			1 "	" 16	270
			1 "	" 14	216
			1 "	" 12	152


JOHN CHATILLON & SONS
MANUFACTURERS OF
BALANCES AND SCALES
OF EVERY DESCRIPTION
89, 91, 93 Cliff St. NEW YORK.

Weight of Flat Iron.

WEIGHT OF RUNNING FOOT IN POUNDS.

Width in Inches.	Thickness in Inches.					
	1-16	1-8	3 16	1-4	5-16	3-8
1	.21	.41	.62	.83	1.04	1.25
1/8	.23	.47	.7	.94	1.17	1.41
1/4	.26	.52	.78	1.04	1.3	1.56
3/8	.29	.57	.86	1.14	1.43	1.72
1/2	.31	.62	.94	1.25	1.56	1 87
5/8	.34	.68	1.01	1.35	1.69	2.03
3/4	.36	.73	1 09	1 46	1 82	2.19
7/8	39	.78	1.17	1.56	1.95	2.34
2	.42	.83	1.25	1.67	2.08	2.5
1/8	.44	.88	1.33	1.77	2.21	2.65
1/4	.47	.94	1.4	1.87	2.34	2.81
3/8	.5	.99	1.48	1.98	2 47	2.97
1/2	.52	1.04	1.56	2.09	2.6	3.12
5/8	.55	1 09	1.64	2 19	2.73	3.28
3/4	.57	1.14	1.72	2.29	2.86	3.44
7/8	.6	1.2	1.8	2.4	2.99	3.59
3	.62	1.25	1.87	2.5	3.12	3.75
1/8	.65	1.3	1 95	2.6	3.26	3.91
1/4	.68	1.35	2 03	2.7	3.38	4.06
3/8	.7	1.4	2 11	2.81	3.52	4.22
1/2	.73	1.46	2.19	2.91	3.65	4.37
5/8	.76	1.51	2.27	3.02	3.78	4.53
3/4	.78	1.56	2.34	3.12	3.91	4.69
7/8	.81	1.61	2.42	3.23	4.03	4.84
4	.83	1.66	2.5	3.33	4.17	5.00
1/8	.86	1.72	2.58	3.44	4.3	5.16
1/4	.88	1.77	2.66	3.54	4.43	5.31
3/8	.91	1.82	2.73	3.64	4.56	5 47
1/2	.94	1 87	2 81	3.75	4.69	5.62
5/8	.96	1.93	2.89	3.85	4.82	5.78
3/4	.99	1.98	2.97	3.96	4 95	5.94
7/8	1.01	2. 3	3.05	4 06	5.08	6.1
5	1.04	2. 8	3.12	4.17	5.21	6.25
1/8	1.06	2.13	3.2	4.27	5 34	6.41
1/4	1.1	2.19	3.28	4.37	5.47	6.56
5 3/8	1.12	2.24	3.36	4.48	5.6	6.72
1/2	1.14	2.29	3.44	4.58	5.73	6.88
5/8	1.17	2.34	3.52	4.69	5.86	7.03
3/4	1.2	2.39	3.59	4.79	6.	7.19
7/8	1.22	2.45	3.67	4 9	6.12	7.34
6	1.25	2.5	3 75	5.	6.25	7.5
1/8	1.27	2.55	3.83	5.1	6.39	7.66
1/4	1.3	2.6	3.91	5.2	6.51	7.81
3/8	1.32	2.66	3.98	5.31	6.64	7.97
1/2	1.35	2.7	4.06	5.41	6.77	8.13
5/8	1 38	2.76	4 14	5.52	6.91	8.29
3/4	1.40	2.81	4.22	5 62	7.08	8.44
7/8	1.43	2.86	4.3	5.73	7.16	8.59
7	1 46	2.92	4.37	5 83	7.29	8.75
1/4	1.51	3.02	4.53	6.04	7.55	9 07
1/2	1.56	3.12	4.69	6.25	7 81	9.37
3/4	1.61	3.23	4.84	6.46	8 07	9.69
8	1.67	3.33	5.	6.67	8.33	10
1/4	1.72	3.43	5.16	6.87	8.6	10.3
1/2	1.77	3.54	5.32	7.08	8.85	10.63
3/4	1.82	3.65	5.47	7.29	9.11	10.94
9	1.87	3.75	5.62	7.5	9 37	11.25
1/4	1.93	3.85	5.78	7.71	9.63	11 56
1/4	1 98	3.96	5.94	7.92	9 89	11.87
3/4	2.03	4.06	6.09	8.12	10.15	12 19
10	2.08	4.17	6.25	8.33	10 4	12 5
1/4	2.13	4.27	6.4	8 54	10.67	12.8
1/2	2.19	4.37	6 56	8.75	10.93	13.13
3/4	2.24	4 48	6.72	8.96	11.20	13.43
11	2.29	4.58	6.87	9.16	11.45	13 75
1/4	2.34	4 69	7.03	9.37	11.72	14.06
1/2	2.39	4.79	7.18	9.58	11.97	14.37
3/4	2.45	4.89	7.34	9.79	12.25	14 69
12	2.5	5.	7.5	10.	12.5	15.
						

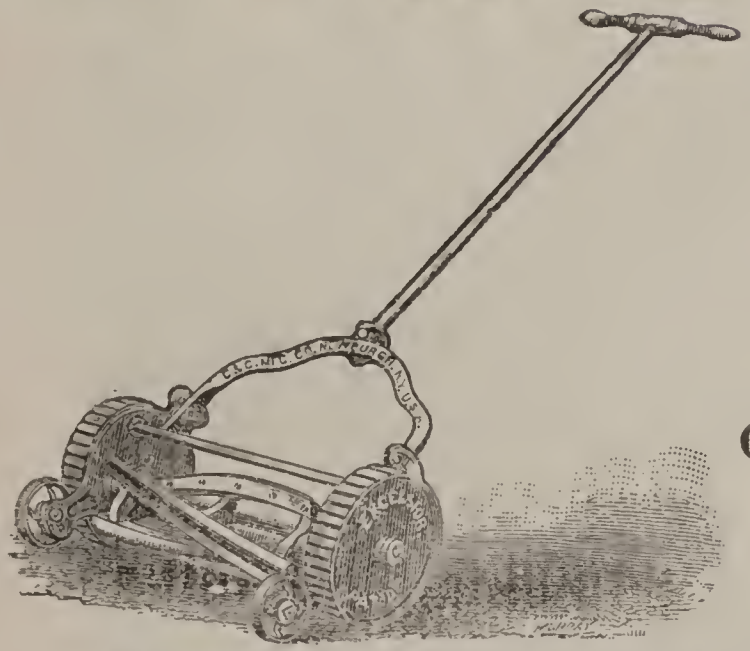
EXCELSIOR and CLIPPER
LAWN MOWERS.

FOR

Horse or Hand Power,

BEST

ON THE MARKET.

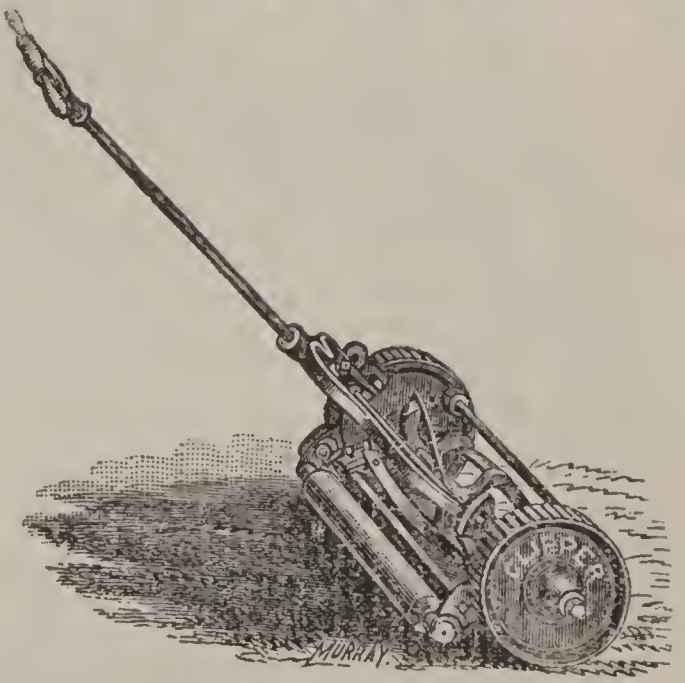


Carefully Constructed,

Readily Adjusted,

AND

Easily Operated.



EACH MOWER IS GUARANTEED IN EVERY PARTICULAR.

Chadborn & Coldwell Manufacturing Co.,

SEND FOR CIRCULARS.

NEWBURGH, N. Y.

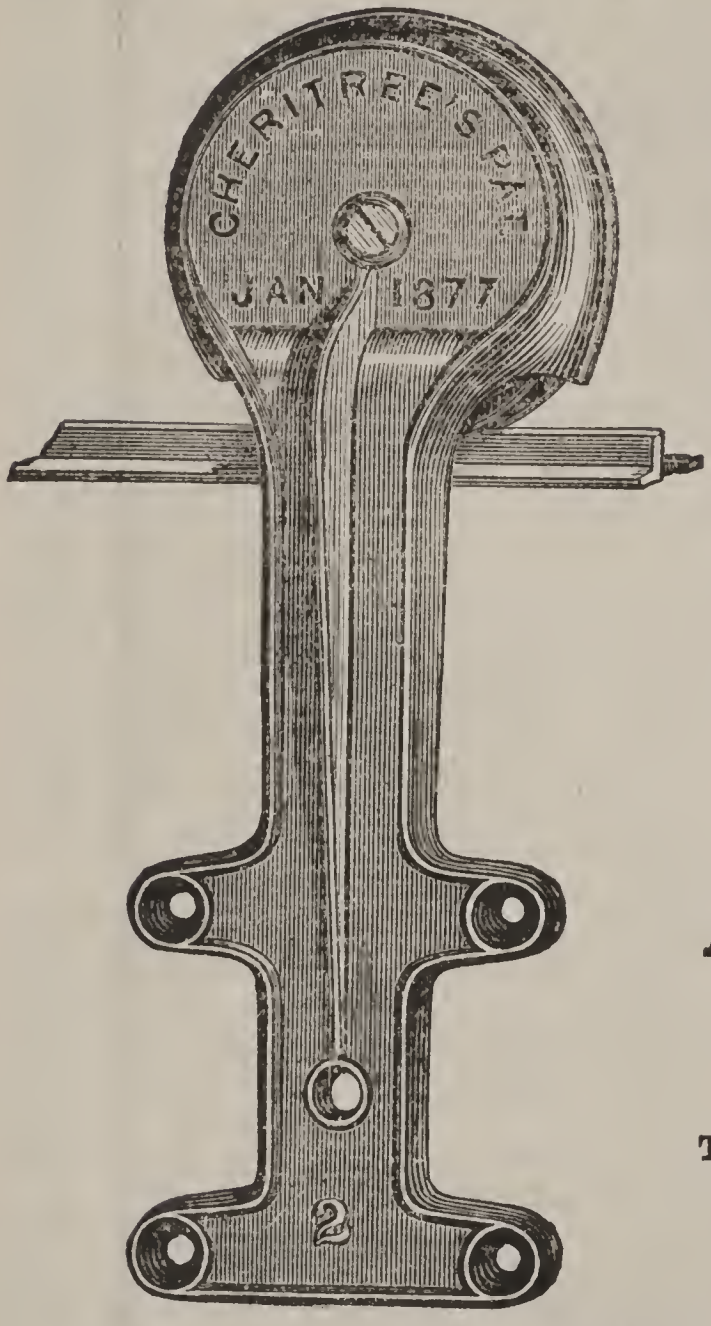
Weight of Flat Iron—Continued.

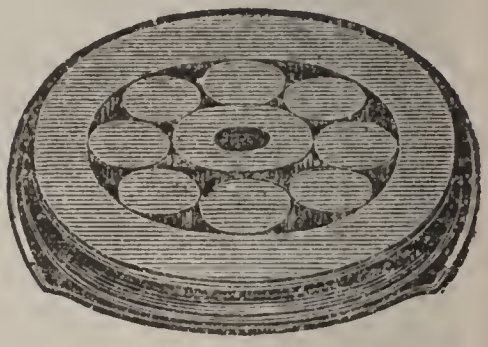
WEIGHT OF RUNNING FOOT IN POUNDS

Width in Inches.	Thickness in Inches.					
	7-16	1-2	5-8	3-4	7-8	1
1	1.46	1.67	2.08	2.5	2.92	3.33
1/8	1 64	1.87	2.34	2.81	3.28	3.75
1/4	1.82	2.08	2.6	3 12	3.65	4 17
3/8	2.01	2.29	2.86	3.44	4.01	4.58
1/2	2.19	2.5	3.12	3 75	4.37	5.
5/8	2.37	2.71	3.38	4.06	4.74	5.42
3/4	2.55	2.92	3.64	4 37	5.1	5 83
7/8	2.73	3.12	3.9	4 69	5.47	6.25
2	2.92	3.33	4.16	5.	5.83	6.67
1/8	3.1	3.54	4.43	5.31	6 2	7 08
1/4	3.28	3.75	4.69	5.62	6.56	7.5
3/8	3.46	3 96	4.95	5.94	6.93	7.92
1/2	3.65	4.17	5.21	6 25	7.29	8.33
5/8	3.83	4.37	5.47	6.56	7.66	8.75
3/4	4.01	4.58	5.73	6.88	8.02	9.17
7/8	4.19	4.79	5.99	7.19	8.39	9.58
3	4.37	5.	6.25	7.5	8.75	10.
1/8	4.56	5.21	6.51	7.82	9 12	10.42
1/4	4.74	5.42	6.77	8.12	9.48	10.83
3/8	4.92	5.62	7.03	8.44	9 84	11.25
1/2	5 1	5.83	7.29	8.75	10.21	11.67
5/8	5.29	6.04	7.55	9.07	10.57	12 08
3/4	5.47	6.25	7.81	9.37	10.93	12.5
7/8	5.65	6.46	8.07	9.68	11.3	12.92
4	5.83	6.67	8.33	10.	11 65	13.33
1/8	6.02	6 87	8.59	10.3	12.04	13.75
1/4	6.2	7.08	8.85	10 62	12 4	14.15
3/8	6.38	7.29	9.11	10.13	12.75	14.59
1/2	6.56	7.5	9.37	11.25	13.12	15 00
5/8	6.74	7.71	9.64	11.55	13.5	15.42
3/4	6.93	7.92	9.89	11.87	13.85	15 83
7/8	7.11	8 12	10.15	12.2	14.22	16.25
5	7.29	8.33	10.42	12.5	14.59	16 66
1/8	7.48	8.54	10 69	12.8	14.95	17.09
1/4	7.66	8.75	10.93	13.13	15.3	17.5

Width in Inches.	Thickness in Inches.					
	7-16	1-2	5-8	3-4	7-8	1
5 3/8	7.84	8.96	11.2	13.43	15.68	17.92
1/2	8.02	9.17	11.45	13.75	16 03	18.33
5/8	8.2	9.37	11.72	14.07	16 4	18.75
3/4	8.39	9.58	11.99	14.37	16.77	19.15
7/8	8.57	9.79	12.25	14 7	17 13	19.58
6	8.75	10.	12.5	15.	17.5	20.
1/8	8.93	10.2	12.77	15.3	17.85	20.42
1/4	9.11	10.42	13.02	15.62	8.23	20.83
3/8	9.3	10.63	13.29	15.93	18.6	21.25
1/2	9.48	10.83	13.53	16.25	18 97	21.65
5/8	9.67	11.03	13.81	16.57	19.33	22 08
3/4	9.84	11.25	14.05	16.87	19.7	22.5
7/8	10.02	11.45	14.32	17.19	20.03	22.92
7	10 2	11 65	14.59	17.5	20.42	23.33
1/4	10.50	12.09	15 1	18.13	21.15	24 15
1/2	10.93	12.5	15.62	18.73	21.85	25.
3/4	11.31	12.92	16..5	19.39	22 62	25.83
8	11.66	13.33	16.65	20.	23 33	26.65
1/4	12 03	13.75	17.18	20.6	24.05	27.5
1/2	12.4	14.17	17.7	21 25	24.8	28.33
3/4	12.76	14.58	18.23	21.89	25.52	29.17
9	13.12	15.	18.75	22.5	26.23	30.
1/4	13.5	15.42	19.27	23 12	26.98	30 83
1/2	13.85	15.83	19 78	23.73	27.7	31.67
3/4	14.2	16.25	20 32	24.35	28.42	32.5
10	14.59	16 65	20.82	25.	29.15	33 33
1/4	14.93	17.08	21.33	25.62	29.88	34.17
1/2	15.3	17.5	21.89	26 25	30.62	35.
3/4	15.67	17.92	22.4	26.85	31.33	35.83
11	16.03	18.33	22.9	27 5	32 08	36.65
1/4	16.4	18.75	23.43	28.12	32.8	37.5
1/2	16.75	19.15	23.93	28.73	33 52	38.33
3/4	17.13	19.59	24.49	29 35	34 25	39.15
12	17.5	20.	25.	30.	35.	40.
.....						

PATENT ANTI-FRICTION
BARN DOOR HANGERS.





A Standard Article,

WITH MERITS

Possessed by No Other

Hanger Made.

THE ONLY REAL

Anti-Friction Hanger

That Stands the Test.

The Sale of them has been unprecedented, and is constantly on the increase.

LIST PRICES.

No. 1,	per dozen Pairs,	. . .	$12.50
No. 1½,	" " "	. . .	13.50
No. 2,	" " "	. . .	15.00

Discount, per cent.

MANUFACTURED BY

T. F. CHERITON HARDWARE CO.,

79 Reade Street, New York.

FLAT IRON.

NUMBER OF FEET IN A BUNDLE OF 112 POUNDS.

Size.	Feet in Bundle.	Size.	Feet in Bundle.
½ by ¼ inch	267	⅞ by ¼ inch	155
½ " 5-16 "	216	⅞ " 5-16 "	122
½ " ⅜ "	175	⅞ " ⅜ "	100
⅝ " ¼ "	214	⅞ " 7-16 "	90
⅝ " 5-16 "	170	⅞ " ½ "	75
⅝ " ⅜ "	145	⅞ " ⅝ "	60
⅝ " ½ "	106	1 " ¼ "	135
¾ " ¼ "	175	1 " 5-16 "	106
¾ " 5-16 "	142	1 " ⅜ "	90
¾ " ⅜ "	120	1 " 7-16 "	78
¾ " 7-16 "	103	1 " ½ "	65
¾ " ½ "	90	1 " 9-16 "	60
¾ " ⅝ "	70	1 " ⅝ "	52

Round and Square Iron.

NUMBER OF FEET IN A BUNDLE OF 112 POUNDS.

ROUND IRON.		SQUARE IRON.	
Size.	Feet in Bundle.	Size.	Feet in Bundle.
3-16 inch	1115	3-16 inch	958
¼ "	688	¼ "	540
5-16 "	440	5-16 "	345
⅜ "	305	⅜ "	240
7-16 "	225	7-16 "	176
½ "	170	½ "	135
9-16 "	136	9-16 "	107
⅝ "	110	⅝ "	87
11-16 "	90	11-16 "	70
¾ "	75	¾ "	60

Round Bar Iron.

WEIGHT OF A RUNNING FOOT IN POUNDS.

Diam. Inch.	Wt per. foot. Lbs.	Diam. Inch.	Wt. per foot. Lbs.	Diam. Inch.	Wt. per foot. Lbs.	Diam. Inch.	Wt. per foot. Lbs.
1-16	.01	1 1-16	2.975	2⅛	11.9	4 ⅛	44.85
⅛	.0411	⅛	3.338	¼	13.3	¼	47.54
3-16	.0925	3-16	3.725	⅜	14.75	⅜	50.33
¼	.1651	¼	4.12	½	16.4	½	53.32
5-16	.2573	5-16	4.545	⅝	18.1	⅝	56.34
⅜	.371	⅜	5.	¾	19.85	¾	59.44
7-16	.505	7-16	5.455	⅞	21.5	⅞	62.62
½	.657	½	5.945	3	23 7	5	65.88
9-16	.835	9-16	6.445	⅛	25.55	⅛	69.23
⅝	1 031	⅝	6.975	¼	27.81	¼	72.65
11-16	1.235	11-16	7.52	⅜	29.85	⅜	76.18
¾	1.475	¾	8.05	½	32.25	½	79.75
13-16	1.74	13-16	8.65	⅝	34.45	⅝	83.45
⅞	2.015	⅞	9.25	¾	37.1	¾	87.20
15-16	2.317	15-16	9.9	⅞	39.5	⅞	91.50
1	2.625	2	10.55	4	41.95	6	95.

FOR STEEL multiply tabular number above (for size) 1.01.

—THE—

PECK, STOW & WILCOX CO.,

SOUTHINGTON, CONN., U. S. A.

MANUFACTURERS OF

Tinners' Machines and Tools,

GENERAL AND STATIONERS'

HARDWARE.

FACTORIES AT

Southington,
Pleasantville,
East Berlin,
} Connecticut, {
Kensington,
West Cheshire,
Birmingham,

— AND —

Cleveland, Ohio.

SALESROOMS :

27 CHAMBERS STREET,

NEW YORK.

SQUARE BAR IRON.

WEIGHT OF A RUNNING FOOT, IN POUNDS.

Thick Inch.	Wt. per ft. Lbs.	Thick Inch.	Wt. per ft. Lbs.	Thick Inch.	Wt. per ft. Lbs	Thick Inch.	Wt. per ft. Lbs.
1-16	0131	1 1-16	3.80	2 1-8	15.15	4 1-8	57.20
1-8	.0525	1-8	4.25	1-4	17.	1-4	60.75
3-16	.1182	3-16	4.73	3-8	18 5	3-8	64.35
1-4	.2103	1-4	5.25	1-2	25.5	1 2	68.
5 16	.3200	5-16	5.78	5-8	23 1	5-8	72.
3-8	.4735	3-8	6.35	3-4	25.2	3-4	75.65
7-16	.6445	7-16	6.95	7-8	27.5	7-8	79.80
1-2	.84	1-2	7.55	3	30.05	5	83.8
9-16	1.063	9-16	8.2	1-8	32.75	1-8	88.25
5-8	1.314	5-8	8.85	1-4	35.5	1-4	92.5
11-16	1 59	11-16	9.57	3-8	38.25	3 8	97.15
3-4	1 891	3-4	10.30	1-2	41.15	1-2	101.
13-16	2.221	13-16	11.05	5-8	44.15	5-8	105.8
7-8	2.575	7-8	11.83	3-4	47.20	3-4	110.5
15-16	2.95	15.16	12.62	7-8	50.25	7-8	115.15
1	3.35	2	13.4	4	53 75	6	120.25

FOR STEEL multiply tabular number above (for size) by 1.01.

BAND IRON.

NUMBER OF FEET IN A BUNDLE OF 112 POUNDS.

Size.		Feet in Bundle.	Size.		Feet in Bundle.
Width.	Thick.		Width.	Thick.	
1⅛ inches.	No. 12	265	2¾ inches	No. 12	110
1⅛ "	" 10	213	2¾ "	" 10	88
1⅛ "	" 7	160	2¾ "	" 8	72
1¼ "	" 12	246	2¾ "	" 6	60
1¼ "	" 10	190	3 "	" 12	101
1¼ "	" 7	145	3 "	" 10	80
1½ "	" 12	205	3 "	" 8	66
1½ "	" 10	160	3 "	" 6	57
1½ "	" 7	120	3¼ "	" 10	75
1¾ "	" 12	175	3¼ "	" 8	60
1¾ "	" 10	138	3¼ "	" 6	50
1¾ "	" 8	110	3½ "	" 10	69
1¾ "	" 7	100	3½ "	" 8	57
2 "	" 12	155	3½ "	" 6	48
2 "	" 10	120	4 "	" 10	60
2 "	" 8	99	4 "	" 8	50
2 "	" 7	90	4 "	" 6	40
2 "	" 6	81	4½ "	" 10	52
2¼ "	" 12	135	4½ "	" 8	43
2¼ "	" 10	105	4½ "	" 6	35
2¼ "	" 8	88	5 "	" 10	48
2¼ "	" 6	72	5 "	" 8	40
2½ "	" 12	120	5 "	" 6	34
2½ "	" 10	95	6 "	" 10	40
2½ "	" 8	77	6 "	" 8	32
2½ "	" 6	65	6 "	" 6	26

Weight of Sheet and Plate Iron.

THICKNESS BY BIRMINGHAM WIRE GAUGE AND INCHES, WEIGHT OF A SQUARE FOOT IN POUNDS.

THICKNESS.		Weight Pounds.	THICKNESS.		Weight Pounds.
B. W. Gauge.	Part of an inch.		B. W. Gauge.	Part of an inch.	
36	.004	.126	11	.120	4 48
35	.005	.2 2		1/8 or .125	5.054
34	.007	.283	10	.134	5.426
33	.008	.322	9	.148	5.98
32	.009	.364		5-32 or .1562	6.305
31	.010	.405	8	.165	6.605
30	.012	.485	7	.180	7.27
29	.013	.526		3-16 or .1875	7.578
28	.014	.595	6	.203	8.005
27	.016	.677		7-32 or .2187	8 79
26	.018	.755	5	.22	8 912
25	.020	.811	4	.238	9.62
24	.022	.912		1/4 or .25	10 09
23	.025	1.018	3	.259	10?37
22	.028	1.137		9-32 or .2812	11.38
	1-32 or .03125	1.259	2	.284	11.525
21	.032	1.31	1	.3	12.15
20	.035	1.416		5.16 or 3525	12.58
19	.042	1.695	0	.340	13.750
18	.049	1.075		11-32 or .3437	13.875
17	.058	2.35		3/8 or .375	15.10
16	.065	2.637	00	.380	15.26
	1-16 or .0625	2.518		13-32 or .4062	16.34
15	.072	2.92	000	.425	17 125
14	.083	3.35		8-16 or .4375	17.65
	3-32 or .0937	3 78	0000	.454	18.30
13	.095	3.85		15-32 or .4607	18.90
12	.100	4.4	00000	1/2 or .50	20.20

Weight of Sheet and Plate Iron.

THICKNESS IN INCHES. WEIGHT OF A SQUARE FOOT IN POUNDS.

Inches Thick.	Lbs. per Square Foot	Inches Thick.	Lbs. per Square Foot	Inches Thick.	Lbs. per Square Foot.
9-16	22.5	1 3/4	70.62	3 7/8	156.51
5/8	25.21	13-16	73.14	4	161.55
11-16	27.75	7/8	75.58	1/8	166.6
3/4	30.25	15-16	78.20	1/4	171.76
13-16	32.75	2	80.75	3/8	176.71
7/8	35.26	1/8	85.75	1/2	181.77
15-16	37.75	1/4	90.81	5/8	186.79
1	40.35	3/8	95.86	3/4	191.84
1-16	42.87	1/2	100.9	7/8	196.9
1/8	45.4	5/8	105.95	5	201.85
3-16	47.9	3/4	111.	1/8	206.9
1/4	50.45	7/8	116.1	1/4	211.95
5-16	52.96	3	121.15	3/8	217
3/8	55.45	1/8	126.21	1/2	222.05
7-16	58.01	1/4	131.26	5/8	227.01
1/2	60.52	3/8	136.32	3/4	232.15
9-16	63.05	1/2	141.37	7/8	237.2
5/8	65.56	5/8	146.41	6	242.25
11-16	68.11	3/4	151.46		

For STEEL PLATES multiply tabular numbers above (for Size) by 1.01.

Weight and Thickness of Boiler Iron.

1-8 inch	weighs 5 lbs.	per sq. ft.	No. 1 Iron is...5-16 inch thick.
3-16 "	" 7½ "	"	No. 3 " ...9-32 "
1-4 "	" 10 "	"	No. 4 " ...1-4 "
5-16 "	" 12½ "	"	No. 5 " ...7 32 "
3-8 "	" 15 "	"	No. 7 " ...3-16 "
7-16 "	" 17½ "	"	
1-2 "	" 20 "	"	

Thickness of Boiler Iron Required

AND PRESSURES ALLOWED BY THE LAWS OF THE UNITED STATES.

Pressure equivalent to the Standard for a Boiler 42-in. in diameter and ¼ in thickness.

Thickness in 16ths.	Diameter in inches.						
	34	36	38	40	42	44	46
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs	Lbs.	Lbs.
5	169.9	160.4	152.	144.4	137.5	131.2	125.5
4½	158.5	149.7	141.8	134.7	128.3	122.5	117 2
4¼	147.2	139.1	131.8	125.1	119.2	113.7	108 8
4	135.9	128.3	121.6	115.5	110.	105	100.
3⅞	124.5	117 6	111.3	105.9	100.8	96.2	92
3⅓	113.2	106.9	101.3	96.2	91.7	87.5	83..
3	101.9	96.2	91.2	82 6	82.5	78.7	75..

Number of Burden's Rivets in 100 Lbs.

Length, Inches.	Thickness in inches.				Length, Inches.	Thickness in inches.			
	1-2	5-8	11-16	3-4		1-2	5-8	11-16	3-4
	1,092	665			3¼	433	267	212	180
	1,027	597				413	248	201	169
1	940	538	450			395	241	192	160
	840	512	415		4		230	184	158
	797	487	389	356			220	177	150
	760	460	370	329			210	171	146
	730	440	357	280			200	166	138
	711	420	340	271	5		190	161	135
	693	390	325	262			180	156	130
	648	375	312	257			172	151	124
2	608	360	297	243			164	145	120
	573	354	289	237	6		157	140	115
	555	347	280	232			150	138	111
	525	335	260	220			146	134	107
	500	312	242	208			143	129	104
3	460	290	224	197	7		140	125	100

BRUSHES

IN EVERY VARIETY,

MANUFACTURED FOR THE TRADE

BY

J. FINLEY SMITH,

NEW YORK,

WHOSE WELL KNOWN AND RELIABLE BRANDS OF

BRUSHES

ARE SO FAVORABLY KNOWN TO THE

HARDWARE TRADE.

Every Brush Warranted as Represented.

Sold by the following Houses, to whom application for Prices and Samples can be made :

LOUDERBACK, GILBERT & CO.,
33 Chambers Street, New York.

QUACKENBUSH, TOWNSEND & CO.,
85 Chambers Street, "

SMITH, COHU & CO.,
79 & 81 Duane Street, "

SMITH'S PATENT KALSOMINE BRUSHES A SPECIALTY.

Brushes of Every Desription

ON HAND OR MADE TO ORDER.

Rails, Splices and Bolts Required for One Mile of Track.

Tons of Rails.

Rule—To find the number of tons (of 2,240 lbs.) of Rail to the mile, divide the weight per yard by 7, and multiply it by 11, thus: for 56 lb. rail divide 56 by 7, equal 8, multiplied by 11, equal 88 tons, for one mile of single track.

Weight of Rail, per yard.	Tons per Mile.	Weight of Rail, per yard.	Tons per Mile.
12 pounds.	12 tons 920 pounds.	45 pounds.	70 tons 1600 p'nds.
14 "	22 "	48 "	75 " 960 "
16 "	25 " 320 "	50 "	78 " 1280 "
18 "	28 " 640 "	52 "	81 " 1600 "
20 "	31 " 960 "	56 "	88 "
22 "	34 " 1280 "	57 "	89 " 1280 "
25 "	39 " 640 "	60 "	94 " 640 "
26 "	40 " 1920 "	62 "	37 " 960 "
27 "	42 " 960 "	64 "	100 " 1280 "
28 "	44 "	65 "	102 " 320 "
30 "	47 " 320 "	68 "	106 " 1920 "
33 "	51 " 1920 "	70 "	110 "
35 "	55 "	72 "	113 " 320 "
40 "	62 " 1920 "	76 "	119 " 960 "

Number of Rails, Chairs, Joints, Splices and Bolts.

Length of Rail.	No. of Rails, Chairs or Joints.	No. of Splices.	No. of Bolts.
18	584	1,168	2,336
20	528	1,056	2,112
21	503	1,006	2,012
22	480	960	1,920
24	440	880	1,760
25	422	844	1,688
26	406	812	1,624
27	391	782	1,564
28	377	754	1,508
30	352	704	1,408

No allowance made for side track in above tables.

Number of Cross Ties for each Mile of Track.

Centre to Centre.	No. of Ties.	Centre to Centre.	No. of Ties.
1½ feet	3,520	2½ feet	2,113
1¾ "	3,017	2¾ "	1,921
2 "	2,640	3 "	1,761
2¼ "	2,348		

Capacity of a Freight Car.

A load is nominally 10 tons of 20,000 lbs. The following can be carried: Whiskey, 60 bbls.; salt, 70 bbls.; lime, 70 bbls.; flour, 90 bbls.; eggs, 130 to 160 bbls.; flour 200 sacks; wood, 6 cords; cattle, 18 to 20 head; hogs, 50 to 60; sheep, 80 to 100; lumber, 6,000 feet; barley, 300 bushels, wheat, 340 bushels; flax seed, 360 bushels; apples, 370 bushels; corn, 400 bushels; potatoes, 430 bushels; oats, 680 bushels; bran, 1,000 bushels; butter, 20,000 lbs.

Weight of one foot of Bar Steel.

ROUND		SQUARE.		OCTAGON.	
Diam. In.	Lbs.	Side In.	Lbs.	Diam. In.	Lbs.
¼	.166	¼	.213	½	.84
⅜	.375	⅜	.479	⅝	1.23
½	.667	½	.855	¾	1.75
⅝	1.04	⅝	1.33	⅞	2.25
¾	1.50	¾	1.91	1	2.75
⅞	2.05	⅞	2.61	1⅛	3.66
1	2.67	1	3.40	1¼	4.55
1⅛	3.38	1⅛	4.34	1⅜	5.50
1¼	4 17	1¼	5.32	1½	6.45
1⅜	5.05	1⅜	6.44	1⅝	7.75
1½	6.00	1½	7.67	1¾	9.20
1⅝	7.05	1⅝	9.00	1⅞	10.04
1¾	8.17	1¾	10.44	2	11.60
1⅞	9.38	1⅞	11.98	2⅛	13.14
2	10.68	2	13.63	2¼	14.75
2⅛	12 04	2⅛	15.35	2¾	16.40
2¼	13.51	2¼	17.20	2½	17.85
2⅜	15.05	2⅜	19.17	2⅝	19.50
2½	16.68	2½	21.20	2¾	21.25
2⅝	18 43	2⅝	23.30	2⅞	22.69
2¾	20.19	2¾	25.70	3	25.00
2⅞	22.00	2⅞	27.74		
3	24.03	3	30.60		
3⅛	26.12	3⅛	33.18		
3¼	28.20	3¼	35.90		
3⅜	30.45	3⅜	38.78		
3½	32 70	3½	41.65		
3⅝	35.12	3⅝	44.17		
3¾	37.54	3¾	46.70		
4	42.71	4	54.40		
4¼	48 22	4¼	61.40		
4½	54.06	4½	68.85		
5	66.75	5	85.00		

American and Birmingham Wire Gauges.

Thickness in Inches. (Taken from Haswell.)

No. of Gauge.	Thick. of Am. G.	Thick. of Bir. G.	No. of Gauge.	Thick. of Am. G.	Thick. of Bir. G	No. of Gauge.	Thick. of Am. G.	Thick. of Bir. of
	Inch.	Inch.		Inch.	Inch.		Inch.	Inch.
0000	.46	.454	11	.0907	.12	25	.0179	.02
000	.4096	.425	12	.0808	.109	26	.0160	.018
00	.3648	38	13	.0719	.095	27	.0142	.016
0	3248	.34	14	.0641	.083	28	.0126	.014
1	.2893	30	15	.057	.072	29	.0112	.013
2	.2576	.284	16	.0508	.065	30	.01	.012
3	.2294	.259	17	.0452	.058	31	.0089	.1
4	.2043	.238	18	.0403	.049	32	.0079	.009
5	.1819	.22	19	.0359	.042	33	.007	.008
6	.1620	.203	20	.0319	.035	34	.0063	.007
7	.1443	.18	21	.0284	.032	35	.0056	.005
8	.1285	.165	22	.0253	.028	36	.005	.004
9	.1144	.148	23	.0225	.025			
10	.1019	.134	24	.0201	.022			

Weight of a Lineal Foot of Flat Steel in lbs.

Inch.	1/8	1/4	3/8	1/2	5/8	3/4	1
1/8	.213	.426	.64	...	...	...	..
5/8	.266	.533	.8	1.066	...	...	...
3/4	.319	.639	.959	1.28	1.6	...	...
1	.426	.853	1.28	1.706	2.133	2.559	...
1 1/8	.48	.959	1.439	1 919	2.399	2.879	3.84
1 1/4	.533	1.066	1.6	2.133	2.666	3.200	4.266
1 3/8	.586	1.173	1.759	2.346	2.933	3.519	4 693
1 1/2	.639	1.279	1.919	2.56	3.199	3.84	5.119
1 5/8	.693	1.386	2.079	2.773	3.466	4.16	5.546
1 3/4	.746	1.493	2.24	2.986	3.733	4 479	5.973
2	.853	1.706	2.559	3.413	4.266	5.119	6.826
2 1/8	.906	1.813	2.719	3.626	4.533	5.439	7.253
2 1/4	.96	1.919	2.879	3.84	4.799	5.76	7.68
2 3/8	1.013	2.026	3.039	4.053	5.066	6.079	8.106
2 1/2	1.016	2.133	3.199	4.266	5.333	6.399	8.533
2 5/8	1.019	2.24	3.36	4.48	5.6	6.72	8.96
2 3/4	1.173	2.346	3.519	4.693	5.866	7.039	9.386
3	1.28	2.56	3.84	5.12	6.4	7.68	10.24
3 1/4	1.386	2.773	4.16	5.546	6.933	8.319	11.093
3 1/2	1.493	2.986	4.48	5.973	7.466	8.95	11 946
3 3/4	1.6	3.199	4.799	6.399	7.999	9.599	12.799
4	1.706	3.413	5.119	6.826	8.533	10.239	13.653
4 1/4	1.813	3 626	5.439	7.253	9.066	10.879	14.506
4 1/2	1.92	3.84	5.76	7.68	9.6	11.52	15.36
4 3/4	2.026	4.053	6.079	8.106	10.133	12.159	16.213
5	2.133	4.266	6.399	8.533	10.666	12.799	17.066
5 1/4	2.24	4.48	6.72	8.959	11.199	13.44	17.919
5 1/2	2.346	4.693	7.039	9.386	11.733	14.079	18.773
5 3/4	2.453	4.906	7.359	9.813	12.266	14.719	19.626
6	2.56	5.12	7.68	10.24	12.8	15.36	20.48

American Sizes of Sheet Iron.

The following table gives the pounds and ounces per square foot of plain and galvanized sheet-iron from No. 14 to No. 29, inclusive, and is the table upon which the current price lists of the rolling mills are based.

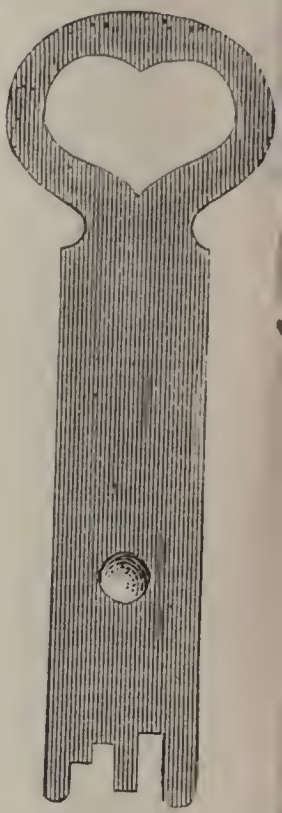
NUMBERS AND WEIGHTS OF SHEET IRON.

No.	Oz.	Lbs.	Oz.	No.	Oz.	Lbs.	Oz.
14.....	60	3	12	23.....	19	1	3
16.....	48	3	0	24.....	17	1	1
17.....	43	2	11	25.....	16	1	0
18.....	38	2	6	26.....	15		
19.....	33	2	1	27.....	14		
20.....	28	1	12	28.....	13		
21.....	24	1	8	29.....	12		
22.....	21	1	5				

A. E. DEITZ,

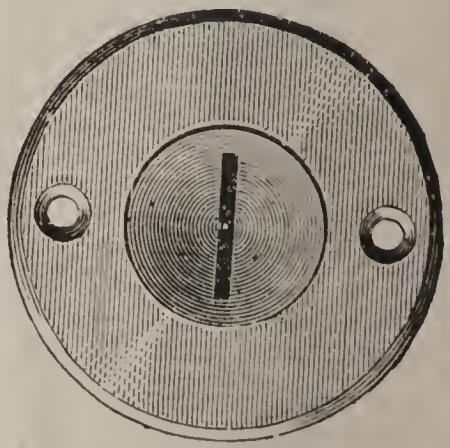
Manufacturer of Store Door Locks, Night Latches.





STORE DOOR LOCK,

No. 172.



DRAWER and PADLOCKS, with Flat Steel Keys.

DURRIE & McCARTY, Sole Agents, 97 Chambers St., N. Y.

Tempering Steel.

(*Haswell.*)

Steel in its hardest state being too brittle for most purposes, the requisite strength and elasticity are obtained by tempering—or *letting down the temper* as it is termed—which is performed by heating the hardened steel to a certain degree and cooling it quickly. The requisite heat is usually ascertained by the color which the surface of the Steel assumes from the film of oxide thus formed.

The degrees of heat to which these several colors correspond are as follows:

At 430, a very faint yellow At 450, a pale straw color.	Suitable for hard instruments; as hammer-faces, drills, &c.
At 470, a full yellow..... At 490, a brown color.....	For instruments requiring hard edges without elasticity; as shears, scissors, turning tools, &c
At 510, brown, with purple spots..... At 530, purple.....	For tools, for cutting wood and soft metals; such as plane-irons, knives, &c.
As 550, dark blue..... At 560, full blue.....	For tools requiring strong edges, without extreme hardness; as cold-chisels, axes, cutlery, &c.
At 600, grayish blue, verging on black.....	For spring-temper, which will bend before breaking; as saws, sword-blades, &c.

If the steel is heated higher than this, the effect of the hardening process is destroyed.

It Has Been Stated

That the temperature of furnaces &c., may be estimated with considerable accuracy by the color of the fire, and that with a little practice the error at very high temperatures will not exceed 90°, or 100°, and the following table contains the result of observations with an air thermometer.

Color of Fire.	Temperature, Degrees F.
Red, just visible.....	977
" dull.....	1,290
" cherry, dull.....	1,470
" " full.....	1,650
" " clear.....	1,830
Orange, deep.....	2,010
" clear.....	2,190
White heat.....	2,370
" bright.....	2,550
" dazzling.....	2,730

Effect of Heat on Various Bodies.

	Degrees
Ammonia boils.....	14
Ammonia (liquid) freezes.....	—46
Antimony melts.....	951
Arsenic melts.....	365
Bismuth melts.....	476
Blood (human) heat of.....	98
" " freezes.....	25
Brandy freezes	—7
Brass melts.....	1,900
Cadmium melts.....	660
Coal Tar boils.....	325
Cold, greatest artificial.....	—166
" greatest natural.....	—56
Common Fire.....	790
Copper melts.....	2,548
Glass melts	2,377
Gold (fine) melts.....	2,590
Gutta-percha softens.....	145
Heat, cherry red.....	1,500
" " (Daniel).....	1,141
" bright red.....	1,869
" red, visible by day.....	1,077
" white.....	2,910
Ice melts.....	32
Iron (cast) melts.....	3,479
" (wrought) melts.....	3,989
Iron, bright red in the dark...	752
" red hot in twilight.....	884
Lead melts.....	594
Mercury boils	662
" volatilizes.....	680
" freezes.....	—39
Naptha boils	146
Petroleum boils.....	306
Platinum melts.....	3,080
Potassium melts.....	135
Proof Spirit freezes	—7
Saltpetre melts.....	600
Sea-water freezes.....	28
Silver (fine) melts.....	1,250
Snow and Salt, equal parts.	0
Spirits of Turpentine freezes.	14
Steel melts.....	2,500
" polished, blue	580
" " straw color.....	460
Strong Wines freeze.....	20
Sulphur melts.....	226
Sulph Acid (sp. grav 1,841) freezes	—45
Tin melts.....	421
Vinous fermentation.....60 to	77
Water in *vacuo* boils.	98
Zinc melts.....	740

The sign — before the figures indicates that many degrees below zero or 0.

LANE & CALE,

MANUFACTURERS OF



HURD'S AXES

— AND —

EDGE TOOLS.

TROY, N. Y.

Standard Length of Cut of Hatchets and Bench Axes.

Nos.	1	2	3
Shingling	3	3	4⅜ inches.
Claw	3½	3⅞	4⅜ inches.
Half	3½	3⅞	4⅜ inches.
Lath	2¾	2¾	3 inches.

No.	1	2	3	4	5	6	7	8	9
Bench	3¾	4½	5	5½	6	6¾	7½	8¼	9 inches.

Weights of Washoe (Adz Eye) Picks.

RAILROAD PICKS.

Nos.	1	2	3	4	5	6	7	8
Weight	5	5½	6	6½	7	7½	8	8½ lbs.

MINING OR DRIFTING PICKS.

Nos.	1	2	3	4	5	6	7	8	9
Weight	3	3½	4	4½	5	5½	6	6½	7 lbs.

POLL PICKS.

Nos.	1	2	3	4	5	6	7	8	9
Weight	3½	4	4½	5	5½	6	6½	7	7½ lbs.

COAL PICKS.

Nos.	1	2	3	4	5	6
Weight	3½	4	4½	5	6	6½ lbs.

Coes' (Genuine) Wrenches.

WILL TAKE NUTS OF THE FOLLOWING SIZES:

Size of Wrench	4	6	8	10	12	15	18	21 in.
Size of Nuts	½	⅞	1¼	1¾	2⅛	2⅝	3	4⅛ in.

Cast Steel Crowbars.

Size ... Inches	¾	⅞	1	1⅛	1¼	1⅜	1½
Usual Weight ... Lbs.	6	8	10	13	17	22	26
Usual Length ... Inches	44	48	52	55	58	66	72

V. G. HUNDLEY,

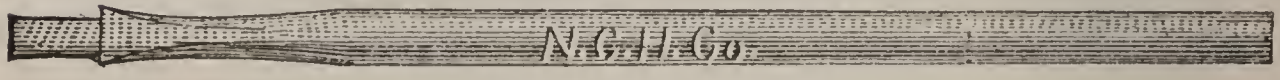
PROPRIETOR OF

North Carolina Handle Co.,



MANUFACTURER OF

HANDLES AND SPOKES,



AND MANUFACTURERS AGENT FOR

WASHOE SOLID PUNCHED

"ADZE-EYE" TOOLS.

OFFICE AND WAREHOUSE,

79 Reade Street and 97 Chambers Street,

NEW YORK.

FACTORY, GREENSBORO, N. C.

Molasses Gates.

No.	1	2	3	4	5
Inside Diameter	13-16	⅞	1¼	1⅜	1½
Bore	1	1⅛	1⅜	1⅝	1 13-16

John Wilson's English Butcher Knives.

LENGTH OF BLADE OF EACH NO.

No.	026	26	27	28	29	30	
Length	4½	5	5¼	5½	6	6½	inches.

No.	43	44	45	46	47	48	49	86
Length	7	8	9	10	11	12	13	14 ins.

Eley Bros.' ("E. B.") Percussion Caps

ARE NUMBERED IN THIS MANNER:

Smallest..	No.	9	24	10	11	18	12	13	14	..Largest.

English Gun Gauge.

SIZES EXPRESSED IN PARTS OF AN INCH.

	Number.												
Bore	5	6	7	9	11	15	19	25	36	52	90	140	300
Inch	1	15-16	⅞	13-16	¾	11-16	⅝	9-16	½	7-16	⅜	5-16	¼

The Sizes of Skates

COMPARE WITH SIZES OF SHOES AS FOLLOWS:

Skates, Inches	7	7½	8	8½	9	9½	10	10½	11	11½
Shoes, No.	9½	11	12½	1	2½	4	5½	7½	9	10½

Plate and Bedstead Casters.

SIZE, IN INCHES, OF WHEELS OF EACH.

Plate.....No	1	2	3	4	5	6	7
Size	⅞	1	1⅛	1¼	1⅜	1 7-16	1½
Bedstead, Old No.	1⅝.0	1⅝.1	1⅝.2	2 in 0	2 in 1	2 in 2	2 in heavy.
New "	101	102	103	104	105	106	107
Size	1⅜	1½	1⅝	1¾	1⅞	2	2¼

Hatter's Size Measure.

To obtain the correct size of the head, use a strip of paper—newspaper will do. Draw it tightly around the largest part of the head, and have the ends just meet. Then measure the length of the paper and the figures below will give you the size according to hatter's measure. An eighth of an inch either way will make no difference. These measures will answer for any style of hat or cap made:

18¾ inches is	5⅞	22¼ inches is	7
19 "	6	22½ "	7⅛
19⅜ "	6⅛	23 "	7¼
19¾ "	6¼	23⅜ "	7⅜
20¼ "	6⅜	23¾ "	7½
20¾ "	6½	24 "	7⅝
21 "	6⅝	24½ "	7¾
21⅛ "	6¾	25 "	7⅞
21⅞ "	6⅞	25¼ "	8

TABLE

SHOWING THE DIAMETER IN DECIMALS OF AN INCH, AND THE NUMBER OF FEET IN ONE POUND OF EACH GAUGE IRON WIRE, AS DRAWN BY THE UNITED STATES MANUFACTURERS.

No.	Decim'ls of inch.	Feet in pound.	No.	Decim'ls of inch.	Feet in pound.
000	.362	2.873	15	.072	72.984
00	.331	3.444	16	.063	95.396
0	.323	3.619	17	.054	129.873
1	.283	4.698	18	.047	172.401
2	.263	5.444	19	.040	222.222
3	.244	6.333	20	.033	301·249
4	.225	7.460	21	.030	370.036
5	.207	8.809	22	.026	476.190
6	.192	10.270	23	.022	640.74
7	.177	12.047	24	.020	879.03
8	.162	14.365	25	.017	1189.71
9	.148	17.238	26	.015	1485.62
10	.135	20.698	27	.014	1872.71
11	.120	26.174	28	.012	2361.42
12	.105	34.254	29	.011	2978.91
13	.092	44.655	30	.010	3754.83
14	.080	59.174			

TABLE

SHOWING CORRESPONDING SIZES OF STUBS' STEEL WIRE OR RODS, TO THE DIVISIONS OF AN INCH.

Nos. 2	12	21	28	30	35	42	48	52	56	61
7-32	3-16	5-32	9-64	1-8	7-64	3-32	5-64	1-16	3-64	1-32

MESH OF COAL SCREENS.

USED BY THE PRINCIPAL COAL DEALERS.

2½, 2¼ and 2 inch		Screens	Furnace Coal.
1¾ and 1½	"	"	Stove out of Egg Coal.
1¼ and 1	"	"	Nut out of Stove "
¾ and ⅝	"	"	Stove Coal.
½ and ⅜	"	"	Nut "
¼	"	"	Pea "
3-16	"	"	Brickmakers' Dust.

OVAL SLIDE VISES.

SIZES OF SCREWS AND LENGTH OF JAWS.

Nos.	00	0	1	2	3	4
Sizes of Screws inches	½	⅝	¾	⅞	1	1⅛
Length of Jaws inches	2	2½	3	3½	4	4½
Weight, pounds.....	7¾	11	18	29	36½	54

SOLID BOX VISES.

LENGTH OF JAW TO EACH SIZE MANUFACTURED.

Nos..	35	40	45	50	55	60	65	70	75	80	85	90
Length of Jaws inches.....	3¾	4	4¼	4½	4¾	5	5	5¼	5¼	5¼	5½	5¾
Weight, pounds (about)	35	40	45	50	55	60	65	70	75	80	85	90

SOLID BOX VISES.—(Continued.)

Nos.....	95	100	110	120	130	140	150	160	170	180	190	200
Length of Jaws inches.....	5¾	6	6	6½	6½	7	7	7¼	7¼	7½	7¾	8
Weight, pounds (about)	95	100	110	120	130	140	150	160	170	180	190	209

Rope and Iron Strapped Tackle Blocks.

DIAMETER OF SHEAVES, AND SIZE OF ROPE TAKEN BY EACH.

Length of Blocks,	inches.	4	5	6	7	8
Diameter of Wheels,	"	2½	3	3½	4¼	5
Diameter of Rope,	"	½	⅝	¾	⅞	1

Length of Blocks,	inches.	9	10	11	12	
Diameter of Wheels,	"	5¾	6½	7¼	8	
Diameter of Rope,	"	1	1⅛	1⅛	1¼	

Thick Mortise Blocks.

Length of Blocks,	inches.	9	10	11	12	15
Diameter of Wheels,	"	5¾	6½	7¼	8	
Diameter of Rope,	"	1¼	1⅜	1½	1½	

Size of Fry Pans.

No.....	0	1	2	3	4	5	6	7	8
Size across top.	8	8½	9	9½	10	11¼	12	13	14 inch.

CORNISH'S
CELEBRATED
Orange County Seeds

PURE AND GENUINE.



FRESH AND RELIABLE.

Merchants and Market Gardeners
CAN SAVE MONEY
BY SENDING FOR OUR WHOLESALE PRICE LIST.

CHOICE SEED POTATOES.



NEW Vegetables, A Specialty.

Our Descriptive Catalogue, containing one of the Largest Collections of
GARDEN FIELD AND FLOWER SEEDS
IN CIRCULATION. SEND FOR ONE.

W. H. CORNISH & CO.,
102 Water St. and 79 Front St.,
NEWBURGH, N. Y.

QUANTITY OF SEED REQUIRED

TO PRODUCE A GIVEN NUMBER OF PLANTS AND SOW A GIVEN AMOUNT OF GROUND.

	Quantity per acre.
Artichoke, 1 oz. to 500 plants	½ lb.
Asparagus, 1 oz. to 200 plants	5 lbs.
Barley	2½ bu.
Beans, dwarf, 1 quart to 150 feet of drill	1¼ "
Beans, pole, 1 quart to 200 hills	½ "
Beet, garden, 1 oz. to 100 feet of drill	10 lbs.
Beet, Mangel, 1 oz. to 150 feet of drill	6 "
Brocoli, 1 oz. to 8,000 plants	5 oz.
Broom Corn	10 lbs.
Brussels Sprouts, 1 oz. to 3,000 plants	5 "
Buckwheat	½ bu.
Cabbage, 1 oz. to 8,000 plants	5 oz.
Carrot, 1 oz. to 250 feet of drill	2½ lbs.
Cauliflower, 1 oz. to 3,000 plants	5 oz.
Celery, 1 oz. to 10,000 plants	4 "
Clover, Alsike and White Dutch	6 lbs.
" Lucerne, Large Red and Crimson Trefoil	8 "
" Medium	10 "
Collards, 1 oz. to 2,500 plants	6 oz.
Corn, sweet, 1 quart to 500 hills	8 qts.
Cress, 1 oz. to 150 feet of drill	8 lbs.
Cucumber, 1 oz. to 80 hills	1¼ "
Egg Plant, 1 oz. to 2,000 plants	8 oz.
Endive, 1 oz. to 300 feet of drill	3 lbs.
Flax, broad cast	½ bu.
Garlic, bulbs, 1 lb. to 10 feet of Drill	
Gourd, 1 oz. to 25 hills	2½ "
Grass, Blue Kentucky	2 bu.
" Blue English	1 "
" Hungarian and Millet	½ "
" Mixed Lawn	3 "
" Orchard, Perennial Rye, Red Top, Fowl Meadow and Wood Meadow	2 "

	Quantity per acre.
Hemp	½ bu.
Kale, 1 oz. to 3,000 plants	4 oz.
Kohl Rabi, 1 oz. to 200 feet of	1½ lbs.
Leek, 1 oz. to 250 feet of drill	4 "
Lettuce, 1 oz. to 250 feet of drill	3 "
Martynia, 1 oz. to 50 feet of drill	10 "
Melon, Musk, 1 oz. to 100 hills	1¾ "
Melon, Water, 1 oz. to 25 hills	1½ "
Nasturtium, 1 oz. to 50 feet of drill	10 "
Oats	2½ bu.
Okra, 1 oz. to 50 feet of drill	10 lbs.
Onion Seed, 1 oz. to 200 feet of drill	5 "
" " for Sets	30 "
Onion Sets, 1 quart to 20 feet of drill	8 bu.
Parsnip, 1 oz. to 250 feet of drill	5 lbs.
Parsley, 1 oz. to 250 feet of drill	8 "
Peas, garden, 1 quart to 150 feet of drill	1½ bu.
" field	2½ "
Pepper, 1 oz. to 1,500 plants	4 oz.
Potatoes	8 bu.
Pumpkin, 1 quart to 300 hills	4 qts.
Radish, 1 oz. to 150 feet of drill	8 lbs.
Rye	1½ bu.
Salsify, 1 oz. to 60 feet of drill	8 lbs.
Spinage, 1 oz. to 150 feet of drill	10 "
Summer Savory, 1 oz. to 500 feet of drill	2 "
Squash, summer, 1 oz. to 40 hills	2 "
" winter, 1 oz. to 10 hills	3 "
Tomato, 1 oz. to 3,000 plants	3 oz.
Tobacco, 1 oz. to 5,000 plants	2 "
Turnip, 1 oz. to 250 feet of drill	1½ lbs.
Vetches	2 bu.
Wheat	1 to 2 "

Velocity and Force of the Wind.

Description.	Miles per Hour.	Feet per minute.	Feet per second,	Force in lbs. per sq. foot.
Hardly perceptible	1	88	1.47	.005
Just perceptible	2	176	2.93	.020
	3	264	4.4	.044
Gentle Breeze	4	352	5.87	.079
	5	440	7.33	.123
Pleasant Breeze	10	880	14.67	.492
	25	1320	22	1.107
Brisk Gale	20	1760	29.3	1.968
	25	2200	36.6	3.075
High Wind	30	2640	44.	4.428
	35	3080	51.3	6.027
Very high Wind	40	3520	58.6	7.872
	45	3960	66.	9.963
Storm	50	4400	73.3	12.300
Great Storm	60	5280	88.	17.712
	70	6160	102.7	24.108
Hurricane	80	7040	117.3	31.488
	100	8800	146 6	49.200

SOMETHING NEW!

THE COMING PLOW!

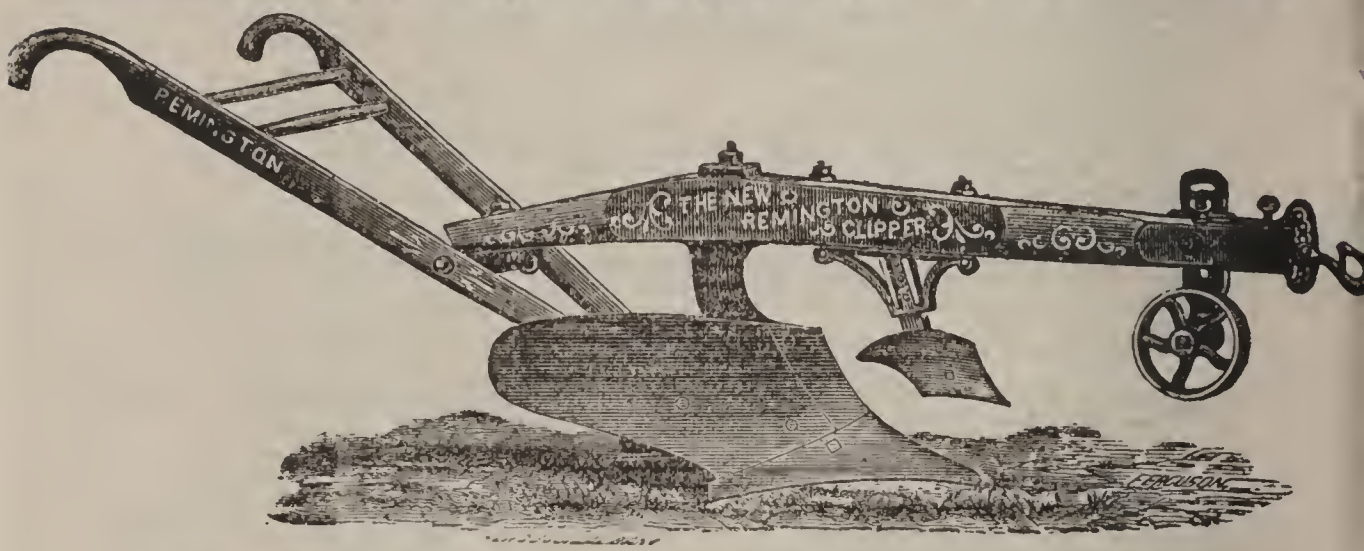
WE GUARANTEE EVERY

Remington Carbon Plow

Well made, of good material, and if properly handled, to give perfect satisfaction, failing in which, after one day's trial, Plow to be held subject to manufacturers' orders.

THE NEW

REMINGTON CARBON CLIPPER!



The NEW REMINGTON CLIPPER enters its third year with a reputation unexampled. It already stands in the front rank of first-class Plows. It is not surpassed in any particular, and it is superior in form, finish, metal, and light weight to any other cast Plow in the market. The carbon metal of which it is made, being one-half cast steel, has all the hardness and scouring qualities of the chilled iron, and is much stronger. It can, therefore, be made the lightest of all the cast Plows.

The form of the **NEW REMINGTON CLIPPER** is acknowledged to be the culmination of Plow improvements. It is simply PERFECT; it is so acknowledged by every one who has seen it. It is the production of the best Plow maker in this country. For lightness of draft and ease of handling, it challenges the world. All we ask is for the farmer to take it home and try it before purchasing any other. He will say that he has never seen its equal.

The **NEW REMINGTON PLOWS,** full rigged, weigh 15 to 30 pounds less than the Chilled Plows of the same capacity. SEND FOR PRICES.

MANUFACTURED BY THE

REMINGTON AGRICULTURAL CO.,

118 Chambers St., New York.

Plants or Trees.

NUMBER TO THE ACRE AT GIVEN DISTANCES.

Dis. apart.	No. Plants.	Dis. apart.	No. Plants.
½ foot	174,240	6 feet	1,210
1 "	43 560	7 "	889
1½ feet	19,360	8 "	680
2 "	10,890	9 "	573
2½ "	6,969	10 "	435
3 feet by 1 foot	14,520	11 "	360
2 " 2 feet	7,260	12 "	302
3 " 3 "	4,840	15 "	193
4 " 1 foot	10,888	18 "	134
4 " 2 feet	5,444	20 "	108
4 " 3 "	3,629	25 "	69
4 " 4 "	2,722	30 "	49
5 " 5 "	1,742		

Customary and Legal Weight of Various Articles in the United States.

	lbs.		lbs.
Apples, per bu.	48	Onions, per bu.	56
" dried, "	24	Peas, "	60
Barley, "	48	Plastering Hair, "	8
Beans, "	60	Rape, "	50
Buckwheat, "	48	Rye, "	56
Broom Corn, "	46	Red Top Seed, "	14
Blue Grass, Kentucky "	14	Salt, Coarse, "	50
" " English, "	24	Salt, Michigan, "	56
Bran, "	20	Sweet Potatoes, "	56
Canary Seed, "	60	Timothy Seed, "	45
Castor Beans, "	46	Turnips, "	55
Clover Seed, "	64	Wheat, "	60
Corn, shelled, "	56	Beef and Pork, per bbl., net	200
" on ear, "	70	Flour, per bbl, net	196
Corn Meal, "	50	White Fish and Trout, per bbl., net	200
Charcoal, "	22	Salt, per bbl	280
Coal, Mineral, "	80	Lime, "	220
Cranberries, "	40	Hay, well settled, per cubic ft.	4½
Dried Peaches, "	28	Corn, on cob, in bin, "	22
Flax Seed, "	55	Corn, shelled, " "	45
Hemp Seed, "	44	Wheat, " "	48
Hungarian Grass Seed "	50	Oats, " "	25½
Irish Potatoes, heaping measure, "	60	Potatoes, " "	38½
Millet, "	50	Sand, dry, "	95
Malt, "	34	Clay, compact, "	135
Oats, "	32	Marble, "	169
Osage Orange, "	33	Seasoned Beech Wood, per cord	5,616
Orchard Grass, "	14	" Hickory, "	6,960

Connelly & Co

DESIGNERS AND ENGRAVERS ON WOOD

make a specialty of mechanical work, and manufacturers will consult their own interests by calling or sending for specimen sheet before having any Work of this kind done.

192 BROADWAY

NEW YORK

Specific Gravity, and Weight

TO CUBIC FOOT OF VARIOUS MATERIALS.

Timber.	Specific gravity.	Weight per cub. foot in pounds.
Ash	.8	50
Beech	.69	43
Birch	.71	44
Cedar	.48	31
Deal, Christ'na	.7	44
Elm	.6	37
Hornbeam	.75	47
Larch	.55	35
Memel	.6	37
Mahogany, Spanish	.8	50
Oak, English	.93	58
Oak, Canadian	.87	54
Pine, Red	.65	41
Pine, Yellow	.45	29
Teak, Moulm'n	.65	41
Yew	.8	50
Miscellaneous.		
Asphaltum	.9	56
Gutta Percha	.98	61
India Rubber	.94	60
Ivory	1.8	112

Fluids.	Specific gravity.	Weight per cub. foot.
Alcohol	.8	50
Ether	.74	46
Oil	.90	56
Water, Fresh	1.000	62.4
Water, Sea	1.028	64.1
Artificial Substances.		
Brick	2.0	124
Brickwork, in mortar	1.6	100
Brickwork, in cement	1.8	112 to 94
Concrete, ordinary	1.9	119
Concrete, in cement	2.2	133
Cement, Portland	1.3	81
Cement, Roman	1.	63
Glass	2.5	156
Lime, quick	.8	50
Mortar	1.7	106
Tile	1.8	112

Stones, Earths, &c.	Specific gravity.	Weight per cub. foot in pounds.
Chalk	2.3	243
Clay	2.	125
Coal	1.3	82
Coke	.8	50
Earth, Rammed	1.6	100
Flint	2.6	163
Gravel	1.9	120
Granite	2.6	164
Grindstone	2.1	131
Limestone	2.5	156
Marble	2.7	168
Sand	1.9	120
Sandstone	2.5	156
Stone, Bath	1.8	112
Stone, Portland	2 1	131
York Flag	2.3	143
Slate	2.8	175
Shingle	1.4	90

Weight of a Cubic Foot of Various Substances,

IN POUNDS.

Metals.		Wood, &c.		Wood, &c.	
Brass	489.	Live Oak	66.75	Coal, Cannel	94.
Gun Metal	543.	Hickory	95.5	Cotton, Bale	14.
Copper	545.	Pine, White	84.	" Pressed	22.
Cast Iron	450.	Spruce	31.25	Earth, Loose	94.
Wrought Iron	482.	Corkwood	15.	" Mud	102.
Lead	710.	Fire Brick	137.	Common Soil	137.
Mercury	849.	Coal, Anthracite	93.	Hay, Bale	9.5
Steel	486.	" Bituminous	80.	" Pressed	25.
" Plates	452.				
Tin	455.				
Zinc, Cast	428				
" Rolled	450.				

ESTABLISHED 1830.

GROVESTEEN & FULLER,

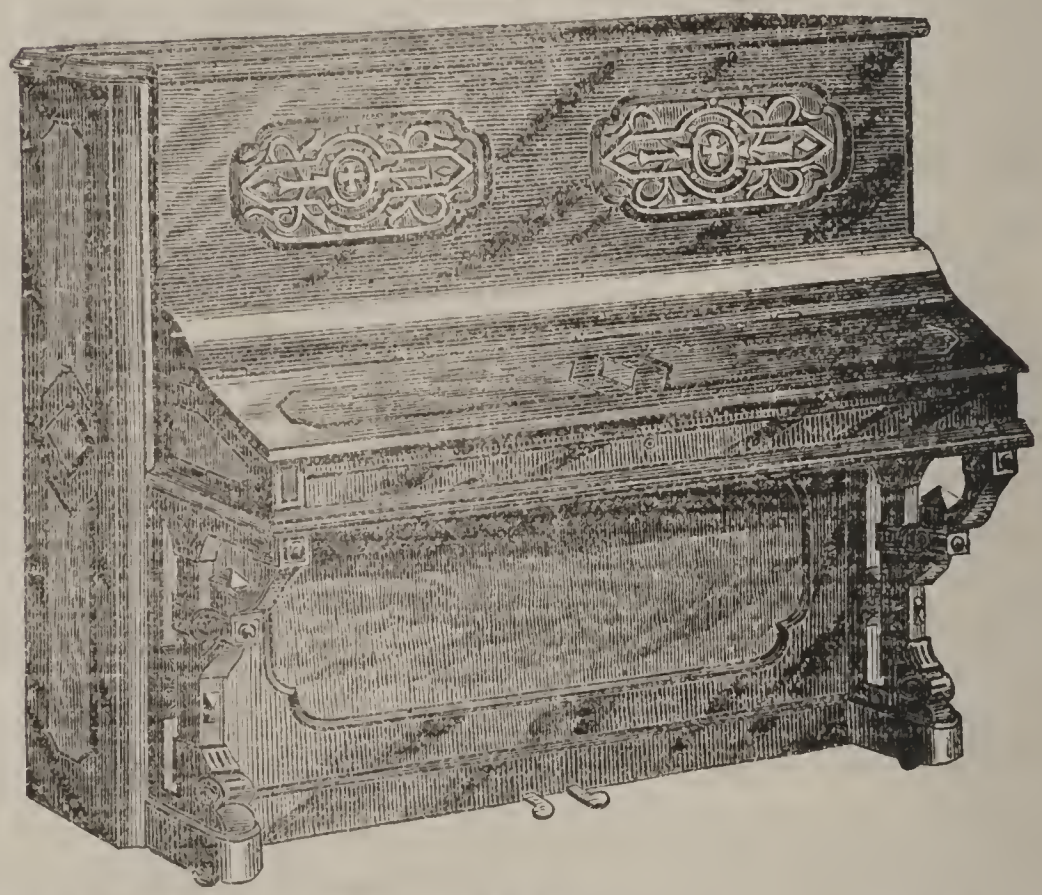
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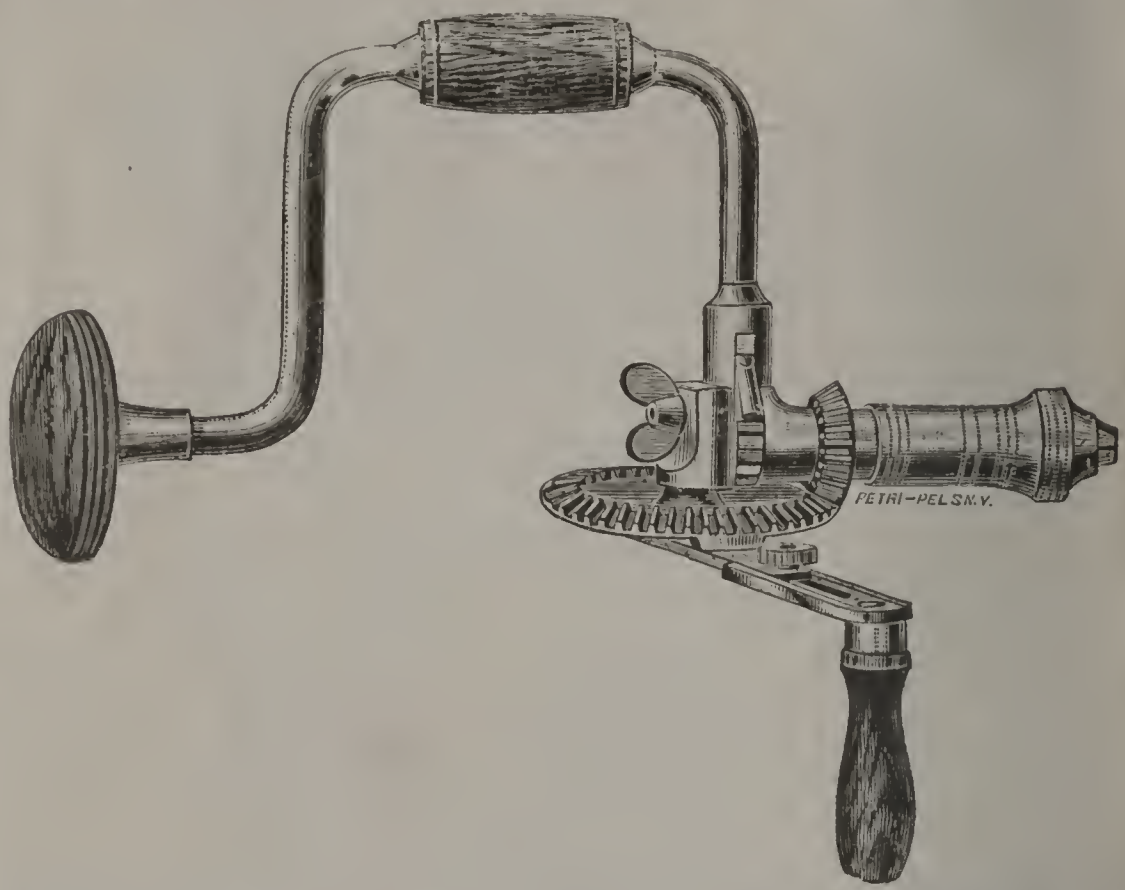
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With each Drill Brace we send an extra set of Forged Steel Jaws, mainly to be used for holding round twist drills less than one eighth of an inch in diameter. As will be noticed in the cut, the large gear wheel has an extension handle to give it more power when needed.

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